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U.S. Forest Service

UNITED STATES DEPARTMENT OF AGRICULTURE

REPORT OF THE FOREST SERVICE

FISCAL YEAR 1978

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I. INTRODUCTION

This annual report of the Forest Service to Congress describes the progress of agency programs during fiscal year 1978. It is the third such report, as required by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (RPA).

RPA, as amended by the National Forest Management Act of 1976, is the the long-range planning framework for all Forest Service activities, encompassing management of the 188-million-acre National Forest System, conduct of cooperative forestry assistance programs, related natural resources research.

The yardstick for this and previous annual reports has been the 1975 RPA Program sent to Congress in early 1976, which was to guide the Agency's activities through the period 1977-1980. It was based on an assessment of all the Nation's renewable natural resources issued at the same time.

Three major projects related to RPA were given high priority during the year.

The most visible of these was the completion of the second Roadless Area Review and Evaluation (RARE II), a process to determine the general future uses of 62 million acres of roadless and undeveloped areas in the National Forests and National Grasslands. It involved the most massive public participation in decisionmaking ever attempted by the agency. Responses to the draft environmental statement for RARE II totaled 264,000 and contained the signatures of almost 360,000 people.

Based on this response, other information, and professional evaluation by the Forest Service and the Department of Agriculture, a recommendation to Congress on the allocation of the 62 million acres was issued by Secretary Bergland January 4, 1979. This recommendation classifies 15 million acres as wilderness, (2) allocates 36.2 million acres to multiple uses other than wilderness, and (3) defers the determination of uses, including wilderness, on 10.8 million acres.

One of the most significant criteria for reaching the recommendation was the assurance that mid-level goals in the 1975 RPA Program for both wilderness and nonwilderness uses could be met. The results of RARE II will be reflected more specifically in the 1980 RPA update.

Preparation of the RPA update was a second major activity for the 1978 fiscal year, again with public participation. A progress report, including outlines shaped by the public for the 1980 Assessment and Program, was issued in early 1978. The draft Assessment and the Program, as a draft environmental statement, will be issued early in 1979.

Both of these will be subject to public review and comment before work starts on preparation of the final documents. Special attention will be given to coordination of RPA activities with preparation by the Soil Conservation Service of its first Resource Conservation Act program involving the Nation's soil and water.

Another active area of long-range planning was the preparation of regulations for the National Forest Management Act (NFMA). This act, containing more specific directions in the form of an amendment to the RPA, sets guidelines for silvicultural practices, land management planning, and other activities. With the assistance of a non-Government committee of natural resource scientists that held open public meetings, the Forest Service drafted regulations for land management planning which were issued in September. The public comment review period was extended twice and closed December 16, 1978.

As a result of recommendations made by the Committee of Scientists in its technical report to the Secretary, as well as an analysis of public comments, a second draft will be issued in March 1979. Both the committee's report and the second draft of regulations will be subject to a 60-day public review period prior to the preparation of final NFMA regulations. Also scheduled for issuance this year are the National Forest Management Act regulations for public participation in decisionmaking.

Congress was an active participant, too, in strengthening the positive effects of Resources Planning Act activities during the 1978 fiscal year. It passed three laws updating and broadening programs in cooperative forestry, forestry research, and renewable resources extension education.

The Cooperative Forestry Assistance Act provided for technical assistance, cost-sharing, and resource protection programs for non-Federal public forest lands, to be carried out through cooperative arrangements with State forestry agencies. The Forest and Rangeland Renewable Research Act modernized and expanded the 50-year-old forestry research program, providing more specific authority to meet current and future research needs, and the Renewable Resources Extension Act expanded the program of the Science and Education Administration Extension Service to provide private forest landowners with education and information about managing and using forests, rangeland, fish and wildlife, water, and other renewable resources.

A primary motivating force behind these laws was a series of oversight hearings conducted in 1977 to review progress in carrying out the 1975 RPA Program. The hearings focused on the need for strengthened and updated Federal programs of forestry research, and assistance and education to private forest landowners.

The report which follows is divided into three major sections. The first is a narrative of major Forest Service accomplishments during the 1978 fiscal year; the second is devoted to special items on which RPA and NFMA require an accounting; the third is an appendix containing more detailed information and statistical tables.

II. PROGRAM ACCOMPLISHMENTS

In 1978 the Forest Service worked towards achieving the Recommended Program established under the Resources Planning Act transmitted by the Secretary of Agriculture to Congress in 1976. This Program established a course of action by year in terms of outputs and funds necessary to achieve long-term goals that accompany the program. Key item quantification is shown in table 1.

The Recommended Program focused on three areas:

1. Dispersed recreation opportunities would be emphasized, along with a moderate allocation of National Forest land to statutory wilderness designation;

2. Timber and range activities would place priority on the most cost-effective resource management and investment opportunities on all lands; and

3. Efforts on behalf of wildlife and fish, land and water stewardship, and human and community development would be accelerated.

A. RECREATION

The goal for the Recreation aspect is to increase the supply of outdoor recreation opportunities and services through Forest Service programs that emphasize dispersed recreation. The construction and reconstruction of trails, implementation of off-road vehicle controls, and coordination with other land uses through landscape management efforts all contributed towards increased dispersed recreation use in FY 1978.

Significant efforts were made in 1978 to provide the public with more information on recreation opportunities. These efforts contributed to a record high 218.5 million recreation visitor-days on the National Forests. This use accounts for more than one-third of all the recreation use on all Federal lands. Recreation use on both developed sites and dispersed areas exceeded the projected RPA highs. Recreation use on the National Forests will continue to accelerate despite funding levels. The consequence of increased funding is improved service to the public, decreased health and safety problems, and improved facilities.

Human resource programs make a significant contribution towards accomplishment of the recreation goal. Approximately 55 percent of the trail construction/reconstruction completed in FY 1977 was done with human resource programs, as well as about 4 percent of all developed recreation site maintenance.

The cooperative forestry program made 2,000 technical assists that influenced the opportunity for recreation on 81,400 acres. These assists were aimed at encouraging private landowners to work towards achieving

the Recommended Program goals. Research efforts in recreation provide the knowledge necessary to meet demands upon the recreation resources while maintaining standards.

The estimated 1978 present net worth for recreation under the RPA Recommended Program was $1.608 billion while the actual 1978 present net worth worth was $1.339 billion discounted at 10 percent (see Section III.B).

Figure 1 is a graph of recreation use targeted under the Recommended Program and actual use figures over time.

Research efforts in 1978 were aimed at determining the amount of private land that is open to public recreation and the attitudes of landowners toward such use. This information will assist not only the Forest Service but the Nation as a whole in providing recreation opportunities in view of the increasing demand.

B. WILDERNESS

The wilderness goal established under the Recommended Program places emphasis on moderate additions to the existing acreage of National Forest wildernesses. Two enactments by Congress added 2,186,825 acres to the National Wilderness Preservation System throughout 10 western States (see Table C-1, page 113). This emphasis in 1978 contributes significantly to achieving the wilderness goal of the Recommended Program. Actual wilderness use occurring in FY 1978 was 8.6 million visitor-days--a figure 23 percent higher than the use estimated in the Recommended Program.

The Recommended Program for wilderness stated that research would be expanded to clarify the role of natural and prescribed fire in wilderness and to determine how to balance wilderness recreation use with nature preservation. Continued research efforts regarding fire will provide the knowledge for future achievement of this goal.

In an effort to provide back-country managers with a method of disposing of human waste at high-elevation campsites where the soil is shallow, Research developed a waste compositing method using a simple bin container. This development will protect the wilderness environment even though use continues to increase.

C. WILDLIFE AND FISH

The direction established under the Recommended Program for wildlife and fisheries provided for increased use and enjoyment of wildlife while increasing both the diversity and numbers to insure the protection of threatened and endangered species. A substantial increase in habitat management would provide for greater species diversity and increased wildlife and fish populations.

A total of 837,000 acres of habitat improvement work was accomplished in FY 1978. This accomplishment exceeded the funded target by 67 percent and the high RPA estimate by more than 20 percent, and provided a total of 3,362,000 acre equivalents of habitat improvement for both fish and wildlife (3,348,000 acre equivalents for wildlife and 14,000 acre equivalents for fish). Acre equivalents are acres of habitat improved, the total being greater than the actual area treated and more fully representative of the impact on wildlife habitat attributed to improvement activities.

The major factor contributing to the large difference between the actual accomplishment and the funded target was the use of prescribed burning. Weather conditions in FY 1978 favored prescribed burning for wildlife in conjunction with burning for other management purposes.

Within the wildlife and fish system human resource programs accomplished approximately 4 percent of the wildlife habitat improvement accomplishment and 30 percent of the fish habitat improvement accomplishment, with most of the work being done by YACC and YCC.

Cooperative efforts between the Forest Service and State fish and wildlife agencies under the Sikes Act resulted in general guidelines to protect habitat for nongame species such as woodpeckers and the spotted owl.

An analysis of the wildlife and fisheries work accomplished in FY 1978 shows that $592 million of present worth benefits are estimated to have occurred with $30 million present worth costs giving a net present worth of $562 million for the year. This compares with an original RPA estimate of $755 million net present worth under the Recommended Program (see Table I). Part of this can be attributed to anadromous fish annually produced from National Forests. From a catch of 28 million salmon weighing 118 million pounds, the value is estimated at $100 million to commercial and sport fisheries.

Efforts conducted through Cooperative Forestry programs with other Federal and State agencies and with private landowners resulted in 3,800 assists on 169,700 acres to encourage nonindustrial private landowners to include habitat protection and development among their own management objectives. Estimates under the Recommended Program targeted between 26,400 and 27,000 assists (see table 1).

Research work in FY 1978 emphasized habitat identification and improvement for endangered species and impacts of alternative forest and range practices on game and nongame habitats. A system has been developed that provides forest managers with information on mammals, birds, fish, reptiles or amphibians in an area, the specific food or cover requirements of individual species, and specific information about a particular species likely to be affected by management actions.

In other research, timber management practices and their effect on fruit produced for wildlife needs have been studied. The quantity and variety of fruit produced as related to density of stand, understory plants growing in different amounts of shade, tree age, and prescribed burning will be useful in managing the forest land for timber while protecting the wildlife habitat.

An effort by the Pacific Southwest Experiment Station and interested other private and Federal Agencies is aimed at restoring the North Kings deer herd of the Central Sierra Nevada. A total management program to improve deer range is being developed. Techniques improving habitat, integrated with timber harvesting, watershed management, and fire management, provide another tool useful in assisting land managers to accomplish the Recommended RPA Program.

D. RANGE

The Recommended Program in the area of range management was intended to meet increasing demands for red meat and to improve range condition. Because of a trend towards grass-fed cattle, the Forest Service goal for FY 1978 was to provide grazing capacity for 11.8 million animal unit months (AUM's) while permitting 9.9 million AUM's on National Forest land. Actual use of 9.0 million AUM's occurred (see table 1 and table C-8). Wild horses and burros accounted for approximately 0.5 percent of the total grazing use on National Forest land in FY 1978.

Forage improvement on 151,000 acres was completed at a cost of $720,000 to increase the grazing capacity and correct unsatisfactory range conditions on National Forest land.

Figure 2 shows the relationship between funding and protection output and the Recommended Program for rangeland management.

Research efforts have resulted in a system to aid range managers in assessing the impact of different land treatments on the environment. Use of this system will allow the study of cause-and-effect relationships of applying range management activities in an effort to meet increasing demand for forage while maintaining the productivity of the land.

Cooperative Forestry provided 600 assists to private landowners in an effort to attain 57.8 to 61.5 million AUM's annually from non-Federal forested range in 1978. Funding for forest range improvement on acreage other than Federal was also aimed at encouraging State and private landholders to increase forage available for grazing.

As of September 30, 1978, 57 percent of the total range allotments on the National Forest System were maintained at an improved management status. Improved management was started on 815 of the remaining allotments, which will lead to an improved biological condition and productivity of these National Forest System range allotments.

E. TIMBER

Although the projected RPA program of 13.8 to 14.6 billion board feet was not funded during FY 1978, the timber sale offered was increased from 11.5 to 12.2 billion board feet by Congress. This increase was made possible by offering sales previously prepared--during the period of strong demand for timber by the housing industry during FY 1978.

A total of 11.0 billion board feet were actually sold at a value of $1,328 million, while 10.1 billion board feet were harvested at a value of $855 million. In addition, 0.5 billion board feet were prepared and released for cutting on previously sold long-term sales. Appeals and court actions challenging land use and timber plans and planned timber sale offerings continue to be major costly barriers to target accomplishment. Significant delays in the ongoing RARE II process would result in a reduction of timber sale offerings in future years. Reductions in the timber sales program would be harmful to both the national and local economies, since 25 percent of the softwood sawtimber is harvested from National Forest lands.

Interdisciplinary reviews, improved silvicultural practices, water monitoring, advance logging systems, and closer contract administration continued to improve the environmental quality of the timber sales program during FY 1978. At the same time, the per unit value of volume sold increased 21 percent over that of FY 1977.

Timber resource inventory was accomplished on 11,057,000 acres, resulting in the revision of 20 timber resource plans. Silvicultural examination was completed on 6,675,000 acres, which provides the data on which to base decisions concerning most timber activities--reforestation, timber stand improvement, and sale preparation. Both timber resource inventory and silviculture examination are key activities that provide timber inventory data used in the land management planning process.

Accomplishment during 1978 in the appropriated reforestation activity was 97 percent and for timber stand improvement it was 89 percent. The shortfall was due primarily to restrictions on the use of herbicides, which limited site preparation and release work. We did not obligate all of the funds available and plan to complete some of this work in fiscal year 1979.

Our ability to complete the K-V portion of the program is dependent on the rate timber purchasers harvest sales. The harvest level fell short of our estimate and represented a decrease from 1977 despite the strong housing market. This decrease coupled with the restrictions on herbicides contributed to much of the shortfall.

Human resource programs accomplished approximately 9 percent of the total appropriated reforestation accomplishment and 10 percent of the appropriated timber stand improvement accomplishment. The main contributors to

these accomplishments are the Young Adult Conservation Corps (YACC) and the Youth Conservation Corps (YCC). Of the total appropriated reforestation accomplishment from human resource programs, YACC provided 91 percent, YCC 5 percent, and Senior Community Service Employment Programs 4 percent. Of the appropriated timber stand improvement accomplishment by human resource programs, 86 percent was done by YACC, 10 percent by YCC, and 4 percent by others. Of the K-V accomplishment reported in table 1, 3 percent of the reforestation acres were done by YACC and YCC, while 2 percent of the K-V timber stand improvement acres were done almost exclusively by YACC.

The Forest Service has made significant work accomplishments under the Youth Conservation Corps and the Young Adult Conservation Corps in the last 2 years. The use of enrollees in these programs for resource accomplishments has helped to some degree to hold down the cost per unit (for appropriated dollars) of accomplishment. However, as more work is accomplished through contracting, costs are expected to continue to escalate. Inflation and the limitations placed on the use of herbicides have increased the cost of reforestation and timber stand improvement.

In the area of better utilization of timber, research has resulted in six significant improvements. A system developed by scientists has the potential to more than double the amount of salable wood from southern pine trees on each acre of land harvested. A technique for solving the problem of warping in the production of yellow-poplar studs holds the potential to reduce the current heavy drain on softwoods and utilize the surplus of small logs. Other developments in resource utilization research aimed at achieving the RPA goals include the use of solar power for drying wood, use of hydraulic pipelines to transport wood chips, making more complete and efficient utilization of forests and mill residues for fuel and the utilization of tropical woods for hardboard production.

Research efforts such as the propagation of Koa, planting techniques for walnut trees on poor sites to increase growth, new models to assist land managers in predicting how well forest trees will respond to management practices, and new tools for efficient use of inventory data are all aimed at working towards the RPA Recommended Program goal for timber.

The RPA Program provided considerable emphasis in increasing private nonindustrial potential timber yields through incentives for the growing of commercial timber and improved use of trees and logs harvested. Estimates for FY 1978 under the Recommended Program ranged from 7.7 to 8.5 billion cubic feet, increasing to 8.5 to 9.2 billion cubic feet in 1980.

Accomplishments for cooperative technical assistance in forest management and processing and for seedling production by State nurseries compare favorably in most categories with those targeted for 1978. The Federal funds available for assistance in State nursery production were substantially greater in 1978 than in 1977, but most of these funds were

allocated for capital investment purposes aimed at increasing nursery capacity. Subsequent increases in seedling production will mostly occur a year or more later.

The reforestation and timber stand improvement targets and accomplishments in Table 1 include non-cost share (technical assistance only), Agricultural Conservation Program (ACP), and Forestry Incentives Program (FIP) activities. The commitment to Congress to reduce the FIP carryover balance was met; the carryover balance was $2.1 million. This will be reflected in increased 1979 accomplishments. FIP reforestation accomplishments, especially in the South, increased significantly in 1978.

The economic and environmental benefits of the cooperative forest management programs are substantial. Over half the Nation's commercial forest land is in nonindustrial private ownership, and our lumber and wood fiber supplies are significantly dependent on these lands. The thrust of the cooperative programs for both rural and urban forestry is to increase and improve management. Proper management not only increases supplies of wood, but also provides such associated forest resource values as esthetics, recreation opportunities, wildlife and fish habitat, improved soil fertility and improved quality and quantity of water yields.

F. ROADS

FY 1978 accomplishment of 793 miles of appropriated road construction was considerably over the targeted figure of 287 miles. This difference can be explained by the fact that: (1) Receipts for FY 1977 exceeded estimated receipts, thereby increasing the Roads and Trails for States (10 percent funds) by approximately $14 million. Approximately $9.9 million of this increase was used for road construction; (2) Target estimates are developed 18 to 24 months in advance of Congressional action on the budget, and they are not that firm.

The target for purchaser-constructed road construction of 10,462 miles was not met in 1978. This falldown can be attributed to the fact that many small business concerns elected to have the Forest Service construct roads in the fourth quarter of the fiscal year. Additional time necessary to advertise and award public work contracts for this work caused some projects to be carried forward into the next fiscal year.

Figure 6 provides a comparison over time of the Recommended Program estimates for road construction and reconstruction through 1990 as with the actual road construction/reconstruction accomplishment through 1978. When both Forest Service-constructed and purchaser-constructed roads are added together the accomplishment falls very close to the RPA estimate range. But when each of these components is taken separately, there seems

to be little relationship to the RPA estimates. This discrepancy can be explained by the fact that the Recommended Program proposed to shift road construction emphasis away from purchaser constructed roads. Since the Recommended Program was introduced, Congress passed the National Forest Management Act, which allows "Small Business" to elect for the Forest Service to perform road construction; therefore, the shift has not occurred as rapidly as the program recommended.

G. SOIL AND WATER

Treatment on 88,000 acres to improve the water quality and soil productivity in FY 1978 equaled the funded targets and exceeded the Recommended Program estimate by 58,000 acres. With the addition of this work it is estimated that about 95 percent of the water produced on National Forests will meet minimum water quality standards. Under the current program level, all water on National Forests will not be brought up to minimum standards until the year 2000. However, the national water quality goals of swimmable and fishable waters will be met by 1985.

Research efforts aimed at strengthening knowledge about soil and water resources targeted in the RPA Recommended Program focused on water quality and mass movement of soil. Basic information gathered and analyzed provided the basis for a system that integrates water quality considerations into land management planning.

Work in the South during FY 1978 was aimed at determining what the normal water pollution level is so as to assist the establishment of water quality standards for forestry operations.

Under the assistance of the Soil Conservation Service watershed protection program, Cooperative Forestry efforts assisted with critical area stabilization by tree planting on 788 acres, the preparation of 1,713 forest watershed management plans covering 135,737 acres, and gully control and stabilization on 5.4 miles of road.

H. PROTECTION

The FY 1978 fire season did not display the severity experienced in FY 1977. Nationwide there was an average decrease in the number of fires by 28 percent, while the total number of acres burned was one-third the previous 5-year average of 201,532 acres. This condition, however, was not evenly distributed throughout the United States. The Central and Southern Rocky Mountains experienced a carryover from the major fire season of 1977. The Southeastern part of the United States experienced a dry fall causing the fire severity to equal that of 1977 in this area.

The increased emphasis on fire prevention contributed towards the actual number of fires being lower than the Recommended Program estimates (see Table 1).

The Forest Service is proud to say that there were no aviation or fire line fatalities in FY 1978. This record is a result of higher standards and increased training over the last decade.

Considerable effort in FY 1978 went into the establishment of fire management areas. A total of 68 areas covering 23 National Forests and 4,804,231 acres were implemented in FY 1978 (see Appendix C, Table C-16). Implementation of fire management areas allows for variable protection objectives based on land management objectives. At all times, a fire will be managed to meet land management objectives, or, if it is not meeting those objectives, it will receive suppression action that is fast, energetic, thorough, and conducted with a high degree of regard for safety of personnel.

Fuel reduction was accomplished on 392,000 acres in FY 1978, exceeding the target of 303,000 acres by 30 percent. This increase can be attributed to good conditions during burning periods and increased use of spring burning. Approximately 3 percent of the total fuel treatment accomplishment was done by human resource program assistance.

Fuel reduction benefits were also obtained on more than 1 million acres of fuels created by land treatment activities such as timber sales, timber stand improvement, road construction, wildlife habitat, and range improvement projects. In addition, approximately one-half million acres of naturally occurring fuels were treated for other purposes. In total, more than 1-3/4 million acres of fuel reduction benefits were accomplished.

Research efforts aimed at improving the efficiency of fire prevention and firefighting operations as established in the Recommended Program were covered in three key research projects during FY 1978.

One such project was in a cooperative effort to analyze the fire problem, and then design, evaluate, and implement prevention programs in vulnerable areas where city and wildland meet.

Another such project by researchers at the Intermountain Station developed a computer model to help assess the fire control value of various fire retardant characteristics. It is anticipated that significant savings can be realized by increasing retardant chemical effectiveness, improving methods of delivery and application, and refining strategy and tactics.

A computer simulation system dubbed FOCUS has been completed by researchers for development and evaluation of long-range fire protection plans. This tool can be utilized to test options of placement and strength of fire stations and air tanker bases and location of fire roads for the purpose of developing an optimum fire organization.

Cooperative Forestry efforts throughout FY 1978 provided assistance covering 748,692,000 non-Federal acres protected upon which 141,956 man-caused fires were recorded in FY 1978. The expenditures for these efforts totaled $228 million, with Federal funds providing $27 million and State and private funds contributing $201 million.

The actual accomplishment figure for FY 1978 was 141,956 man-caused fires. The actual accomplishment was lower than the established target but the actual was considerably over that of the RPA estimate.

I. LANDS

Total accomplishment for land acquired and exchanged was 1,700 acres less than the target established for FY 1978. This accomplishment exceeded the 1978 estimated range under the Recommended Program (see Table 1). Within the total accomplishment is included 29,963 acres of land acquired by donation from 14 landowners.

The target of 8,141 miles for land line location for FY 1978 was not achieved. Actual accomplishment of 5,400 miles amounted to 66 percent of the target for FY 1978 but exceeded the high estimate made for 1978 under the Recommended Program. The reasons for this falldown were:

A. Cadastral surveyors could not be recruited and trained and be fully productive in 1 year's time;

B. The cost per mile of surveying and posting to Forest Service standards exceeded the budget estimates.

Approximately 10 percent of the land line location accomplishment was done with human resource program assistance. YACC was by far the largest contributor to this work.

J. MINERALS

Interest in the area of minerals management in FY 1978 resulted in the development and administration of 14,500 operating plans for leasable, locatable, reserved, and common variety minerals developed and administered.

Comprehensive environmental statements in the areas of geothermal leasing, mining reclamation and coal leasing were completed.

K. HUMAN RESOURCE PROGRAMS

The goal established under the Recommended Program for Human Resource programs stated that Forest Service involvement in this area would continue. Greater emphasis would be placed on efforts that are most closely related to natural resource management and development and complement the activities in other Forest Service resource systems.

Within the Human Resource program area are four major funded programs that received considerable effort in 1978. Those four areas were:

1. Senior Community Service Employment

2. Young Adult Conservation Corps

3. Job Corps

4. Youth Conservation Corps.

These programs in FY 1978, integrated with the regular Forest Service programs, succeeded in providing work, skills, training, and education to approximately 49,000 unemployed, elderly, young, and other disadvantaged people. These totals do not include unfunded programs such as Volunteers in the National Forests and hosted programs such as CETA, SCSEP, etc. The total value of work accomplished by these four major and other human resource programs is estimated at $118 million directly associated with resource and conservation efforts. The costs associated with achieving this benefit are approximately $150 million.

The $118 million estimate of the value of work for total human resource programs does not compare with the Economic Analysis Summary figures in Table 4. This difference can be explained by the fact that under the original RPA Recommended Program, estimates of costs and benefits for only the Forest Service's share of the Youth Conservation Corps were displayed. Job Corps and other human resource programs that are allocated funds were not included. To provide a comparable figure for FY 1978, only the costs and value of work from the Forest Service's share of the total value of work and costs for the Youth Conservation Corps was utilized in Table 4.

Under the Senior Community Service Employment program, the USDA Forest Service, in a cooperative program with the U.S. Department of Labor enrolled approximately 3,500 older workers on various conservation projects that contributed over $12 million of appraised work in the areas of maintenance of recreational areas, improvement and maintenance of trails, timber stand improvement, wildlife habitat improvement, etc. These contributions are in complete harmony with the overall Recommended Program in other resource areas.

The Young Adult Conservation Corps program is a relatively new program whose first full year of operation for the Federal component was FY 1978. As of September 30, 1978, 8,696 enrollees were working on Forest Service conservation projects. Efforts through the year provided benefits estimated to exceed $61 million of conservation work.

Youth Conservation Corps in FY 1978 enrolled over 14,200 young people between the ages of 15 and 18 years old. Value of work from this segment of the Human Resource Programs has been estimated at $18 million at a cost of $21 million.

The Job Corps Program in FY 1978 enrolled approximately 7,000 youth and contributed $11 million of estimated resource work benefits at a cost of $32 million.

The figures in this report, except where noted, reflect only USDA, Forest Service programs and do not include grants to States or other Agency participation.

The Urban and Community Forestry (U&CF) program, under cooperative Forestry Supervision, was initiated in 1978. The Federal funds appropriated for this program allowed many States to employ urban foresters and to commence their own urban forestry programs. Forestry assistance was provided to over 6,500 urban areas. Accomplishments in the newly established U&CF program are considerably higher than those foreseen when the Recommended Program was developed.

TABLE 1
PROGRAM ACCOMPLISHMENTS

Item	Unit of Measure	RPA Estimates High	RPA Estimates Low	FY 1978 Funded Targets	FY 1978 Accomplishments
Recreation Use	Million RVD's	211.3	202.8	213.0	218.5
Wilderness Maintained	Million Acres	15.2	15.2	15.2	14.8
Trail Const./Reconstr.	Miles	760.0	760.0	600.0	2,119.0
Habitat Improvement	Thousand Acres	682.0	641.0	502.0	837.0
Range Grazing Capacity	Million AUM's	18.1	16.0	----	11.8
Permitted Livestock Grazing	Million AUM's	12.9	12.1	10.0	9.9
Potential Yield	Billion CU. Ft.	2.88	2.72	----	3.24
Timber Sale Offering	Billion Bd. Ft. 1/	14.6	13.8	12.2	12.2
Silvicultural Exams	Thousand Acres	8,064.0	8,064.0	6,788.0	6,675.0
Refor.-Appropriated	Thousand Acres	254.0	226.0	206.0	199.0
Refor.-KV	Thousand Acres	236.0	236.0	254.4	212.3
Timber Stand Imp.-Approp.	Thousand Acres	551.0	506.0	287.0	256.2
Timber Stand Imp.-KV	Thousand Acres	236.0	236.0	180.1	164.2
Road Constr.-Appropriated	Miles	1,431.0	1,347.0	287.0	793.0
Road Constr.-Purchaser	Miles	9,003.0	8,479.0	10,462.0	9,759.0
Fire Prevention - NFS	No. of Man-Caused Fires	6,209.0	6,592.0	----	5,217.0
Fuels Management - NFS	Thousand Acres	391.0	368.0	303.0	392.0
Land Acquired & Exchanges	Thousand Acres	121.0	114.0	125.0	122.3
Land Line Location	Miles	3,956.0	3,745.0	8,141.0	5,407.0
Mineral Leases and Permits	Million Acres	28.0	26.1	----	----
Soil & Water Resource Imp.	Thousand Acres Treated	50.0	50.0	88.0	88.0

TABLE 1 (Continued)
PROGRAM ACCOMPLISHMENTS

Item	Unit of Measure	RPA Estimates High	RPA Estimates Low	FY 1978 Funded Targets	FY 1978 Accomplishments
Youth Conservation Corps	No. of Participants (thousands)	39.0 7/	39.0 7/	44.0 7/	14.2 8/
Job Corps	No. of Enrollee Completors (thousands)	6.7	6.3	----	7.7
Other Cooperative Human Resource Programs	No. of Participants (thousands)	9.3	8.7	----	----
Recreation Tech. Assistance	Thousand Assists	14.1	13.2	1.3	2.0
	Thousand Acres	----	----	115.0	81.4
Wildlife and Fish Tech. Assistance	Thousand Assists	27.0	26.4	2.3	3.8
	Thousand Acres	----	----	121.0	169.7
Range Landowner Assistance	Thousand Assists	7.6	7.4	0.3	0.6
Forest Range Improvement	Thousand Acres	1,100.0	1,100.0	68.0	50.4
Tech. Assist - Timber Harv.	Million Cu. Ft.	----	----	190.0	225.0
Tech. Assist - Forest Land Mgmt. Plans	Thousand Plans	61.0	57.3	44.8	44.9
Tech. Assist - Forest Land Mgmt. Plans	Thousand Acres 2/	4,270.0	4,010.0	3,270.0	3,200.0
Reforestation	Thousand Acres 3/	727.0	696.0	282.0	325.6
Forestry Incentives Prog.	Thousand Acres	----	----	(158.4)	(168.8)
Timber Stand Improvement	Thousand Acres 3/	494.0	473.0	230.0	274.7
Forestry Incentives Prog.	Thousand Acres	----	----	(130.6)	(139.7)
Seedling Production and Distribution-State Nurseries	Million Seedlings	1,027.0	982.0	575.0	655.4 4/
Improved Tree Seed	Thousand Pounds	----	----	30.0	30.0

TABLE 1 (Continued)
PROGRAM ACCOMPLISHMENTS

Item	Unit of Measure	RPA Estimates High	RPA Estimates Low	FY 1978 Funded Targets	FY 1978 Accomplishments
Improved Utilization	Million Cu. Ft. 2/	324.0	305.0	170.0	164.4
Urban and Community Forestry Assistance	Urban Areas Assisted	1,900.0	1,687.0	157.0	6,508.0
Insect and Disease Survey	Million Acres 2/	813.0	----	628.0	605.2
Insect and Disease Suppression	Million Acres 2/	4.2	---	2.4	2.0
Fire Assistance - S&PF					
Person Caused Fires	No. of Fires 2/	91,497.0	----	142,600.0	136,000.0
Acres Prot. from Fires	Thousand Acres 2/	943,730.0	----	838,000.0	749,000.0
Acres Burned	Thousand Acres 2/	1,113.0	----	2,100.0	1,800.0
Receipts to Treasury	Million Dollars	609.3	573.9	----	956.0
Costs 5/ NFS	Million Dollars 6/	1,379.1	1,298.8	1,117.4	1,117.4
Research		132.8	126.0	108.5	108.5
S&PF		149.5	107.8	80.4	80.4

1/ Conversion rate is 5 board feet per cubic foot.

2/ For equavalency with current planning and reporting requirements, the indicated 1975 RPA Recommended Program units of measure have been converted.

3/ Includes non-cost share, FIP, and ACP. FY 1978 accomplishment differs from figure in FY 1980 Explanatory Notes since that figure only includes non-cost share.

4/ Figure reflects cooperative accomplishment for the cooperation in Forest Tree Production Tree Program and Federal technical assistance to other State tree nursery programs.

5/ To make the original RPA estimates (base year 1975) compare with actual expenditures for FY 1978 an inflation factor of 1.205 was utilized. This inflation factor was derived from the Economic Report of the President, January 1978, Table B-3, Federal Government Purchases of Goods and Services column.

6/ Costs do not include the following items: permanent appropriations, trust funds, and allocated funds.

7/ Total program including grants and U. S. Department of the Interior portion.

8/ USDA-Forest Service program only.

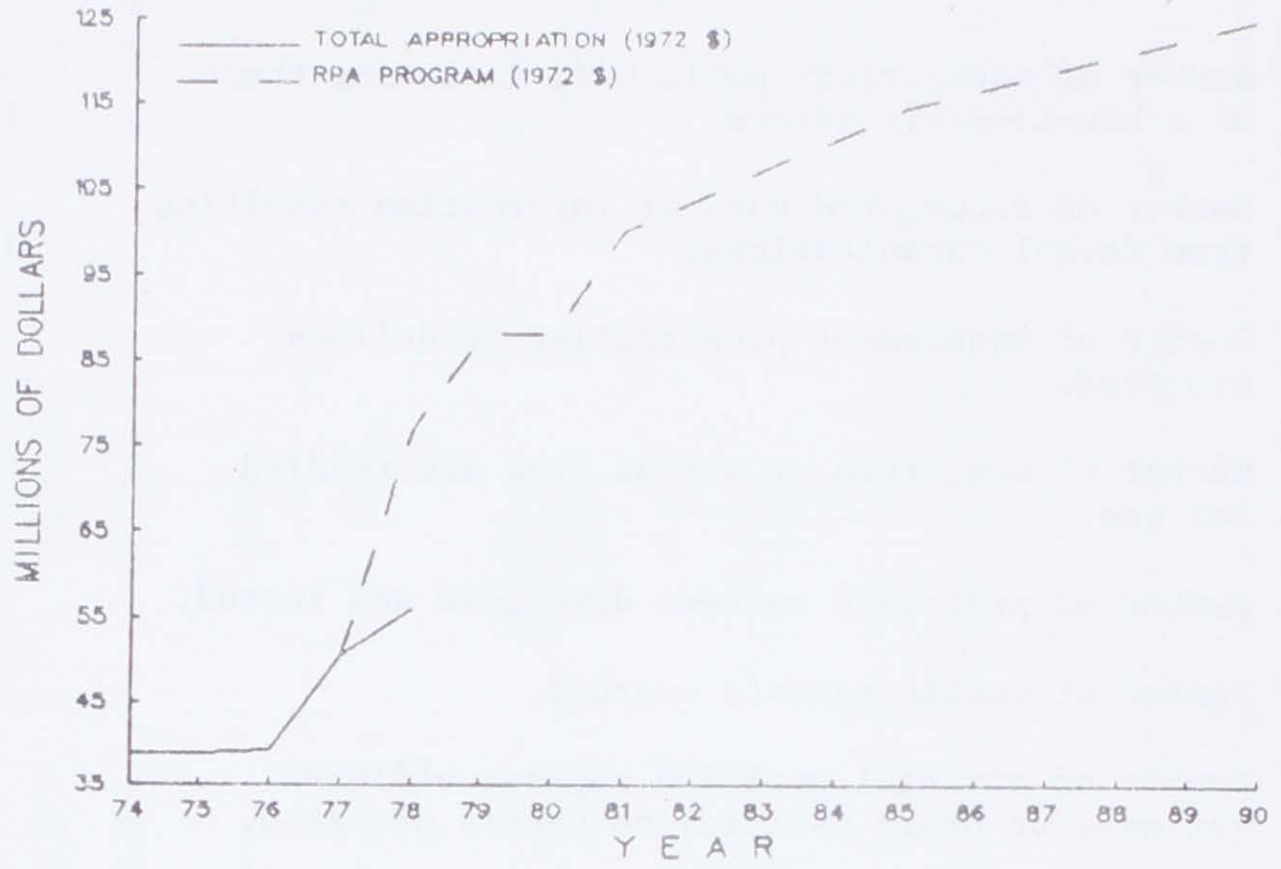
TABLE 2

SUMMARY OF RESEARCH ACCOMPLISHMENTS IN 1978

a.	Number of manuscripts published, including those of a how-to-do-it nature.	1,780
b.	Number of documented uses of information resulting from formal consultations.	1,331
c.	Number of management prescription guidelines accepted.	272
d.	Number of new trees or shrubs bred and readied for use.	4
e.	Number of prototype systems developed and tested.	45
f.	Number of public patents awarded.	12
g.	Number of official position papers, official reviews, or other official documents prepared.	730
h.	Number of training documents prepared.	147
i.	Number of computer models or programs placed in use.	126
j.	Number of slide talks produced for distribution.	59
k.	Number of films produced for distribution.	6
l.	Number of workshops, symposia, or training sessions hosted.	479

FIGURE 1

RECREATION USE – DEVELOPED & DISPERSED



RECREATION USE – DEVELOPED AND DISPERSED

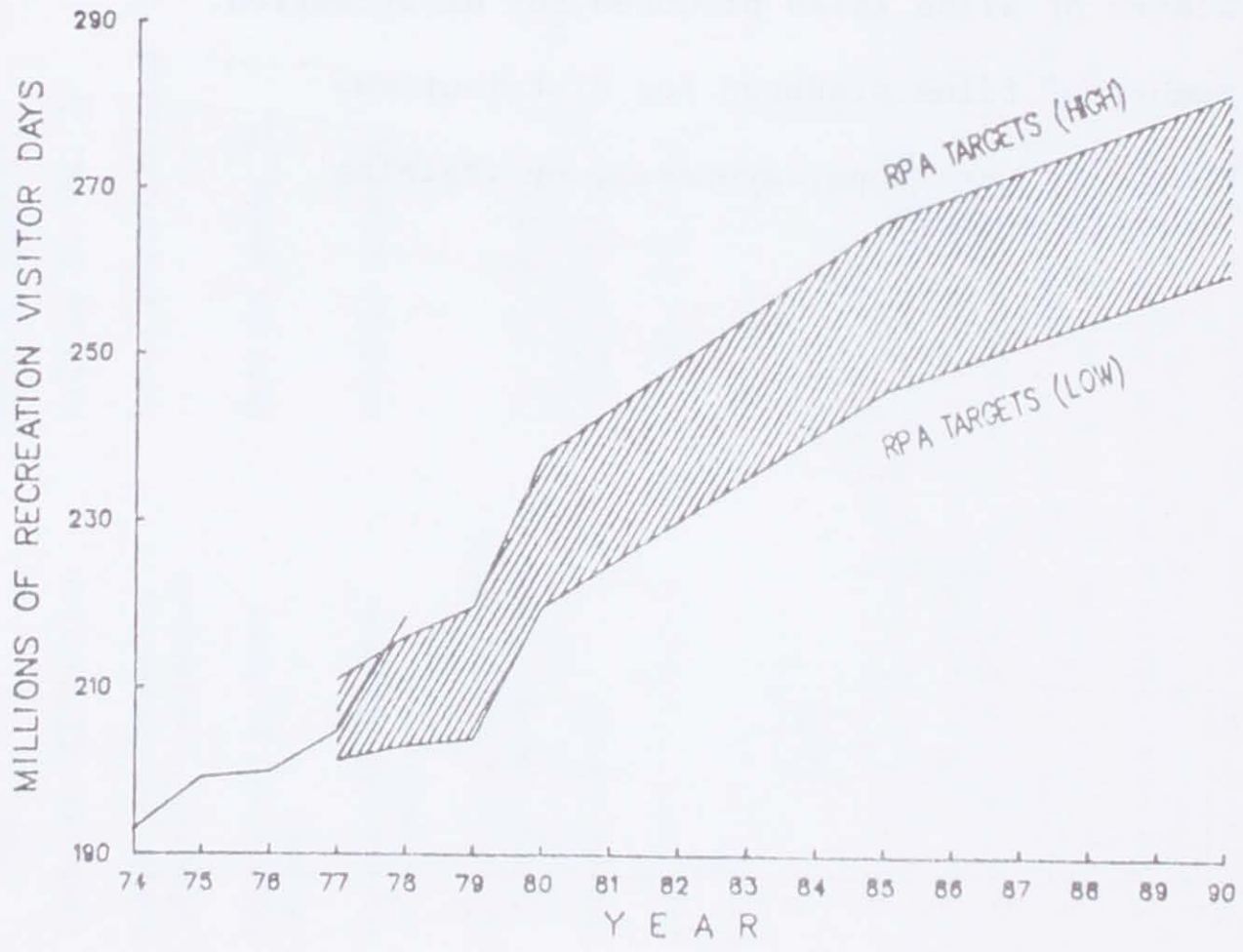
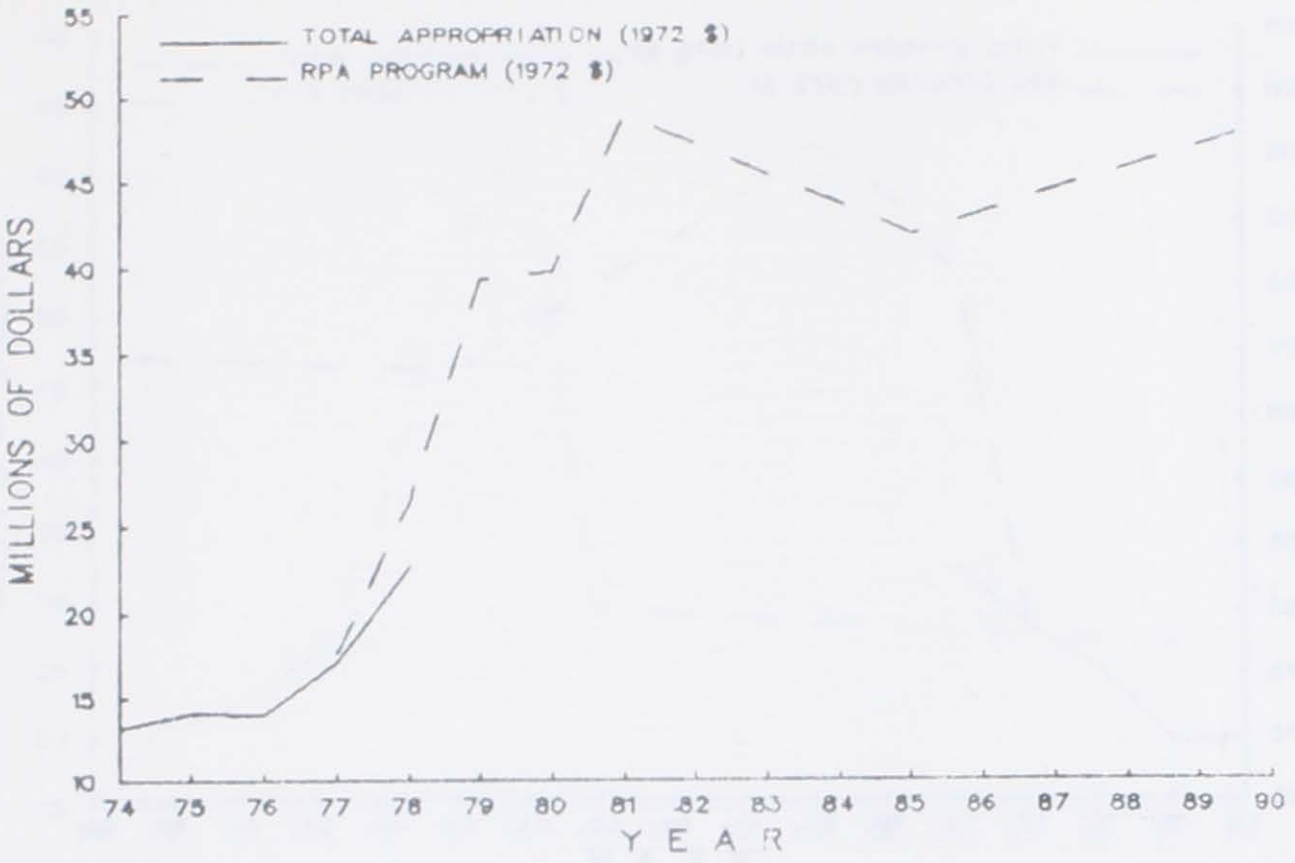


FIGURE 2
RANGELAND MANAGEMENT



RANGELAND MANAGEMENT

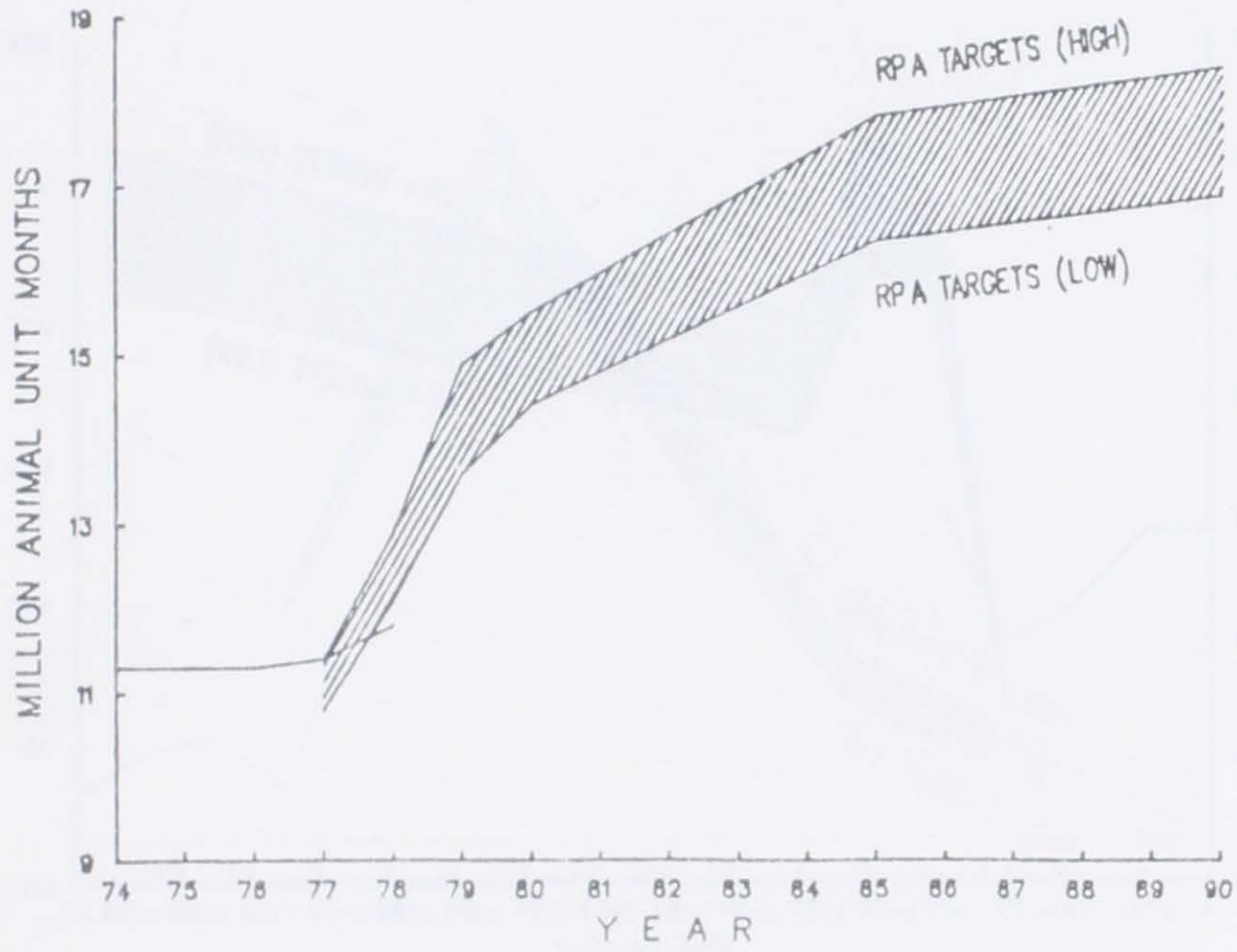
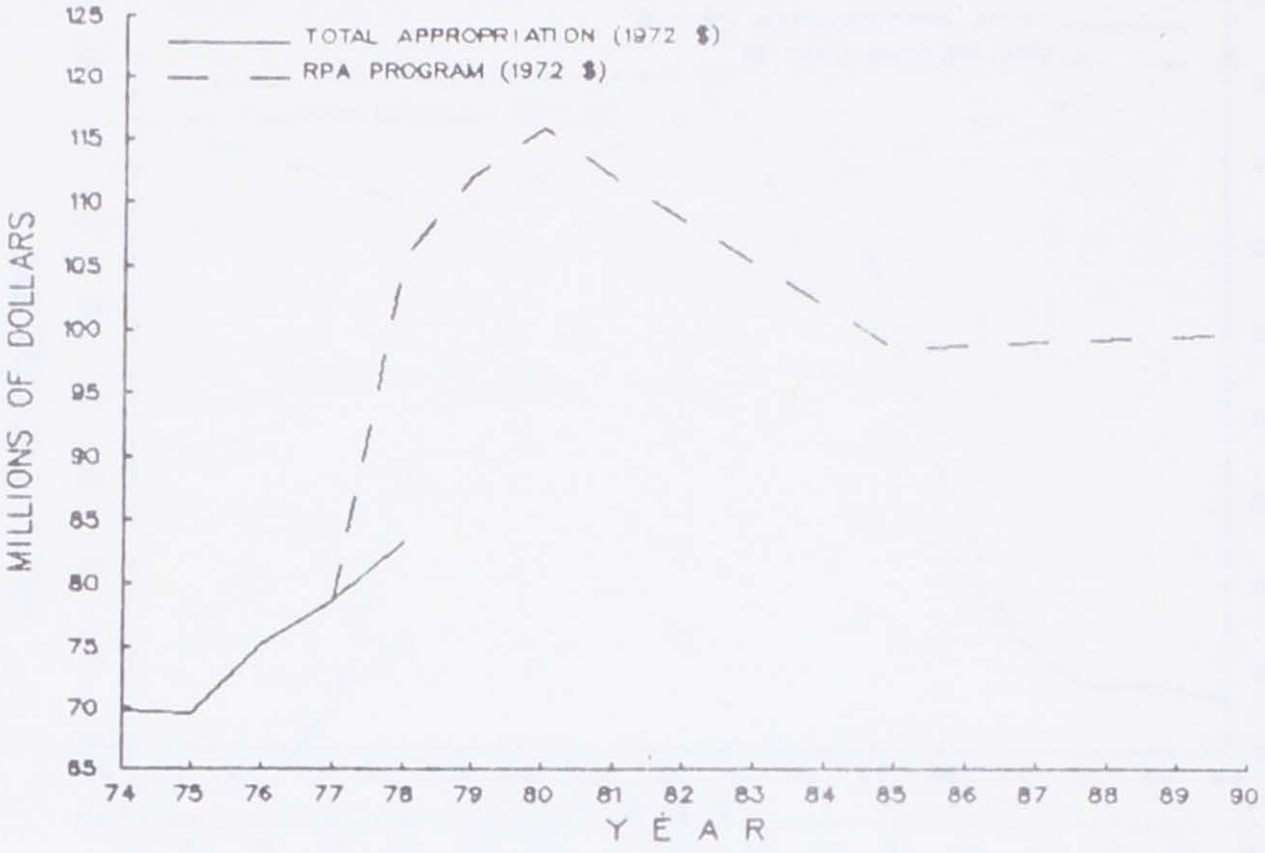


FIGURE 3

SALES ADMINISTRATION AND MANAGEMENT



SALES ADMINISTRATION AND MANAGEMENT

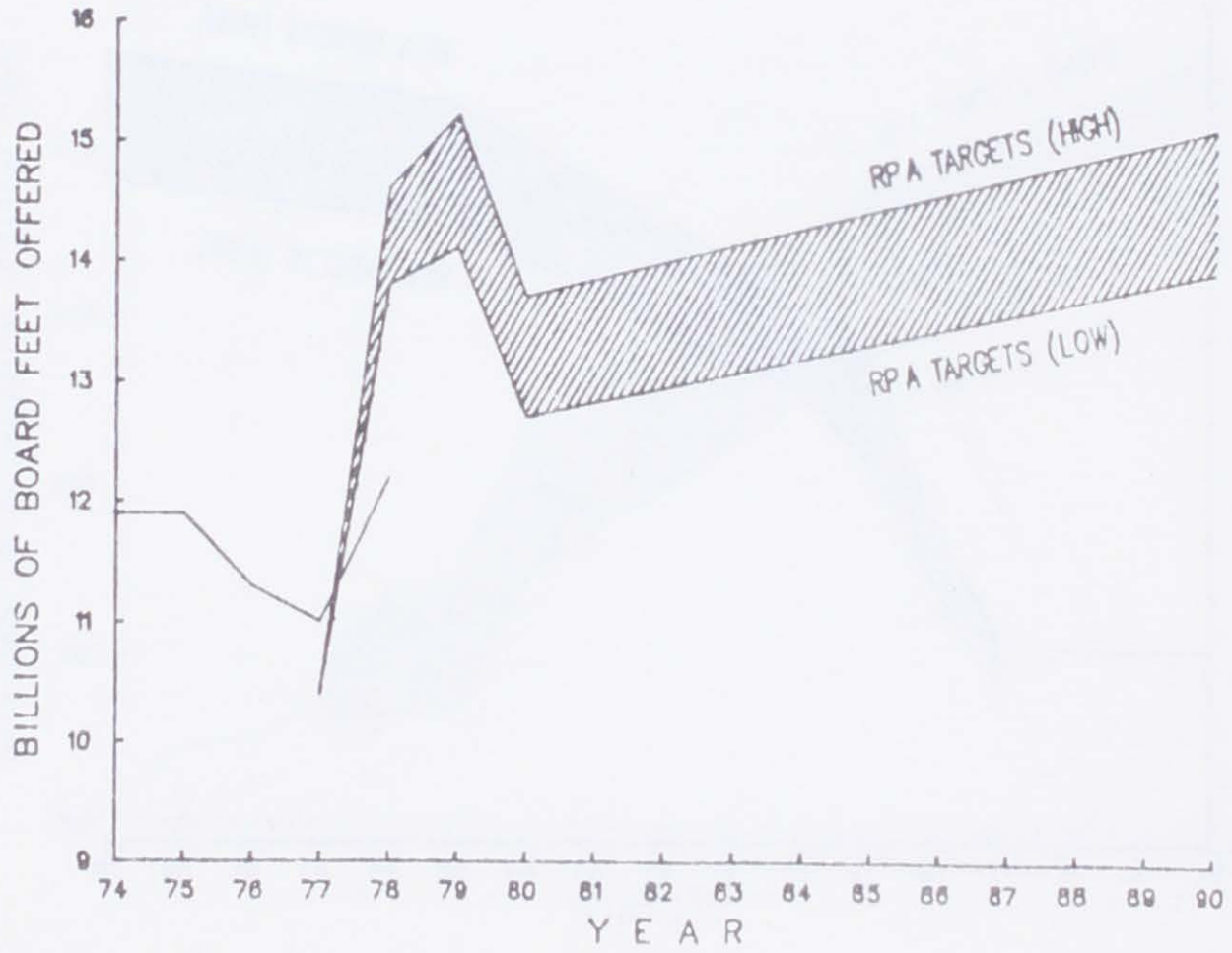
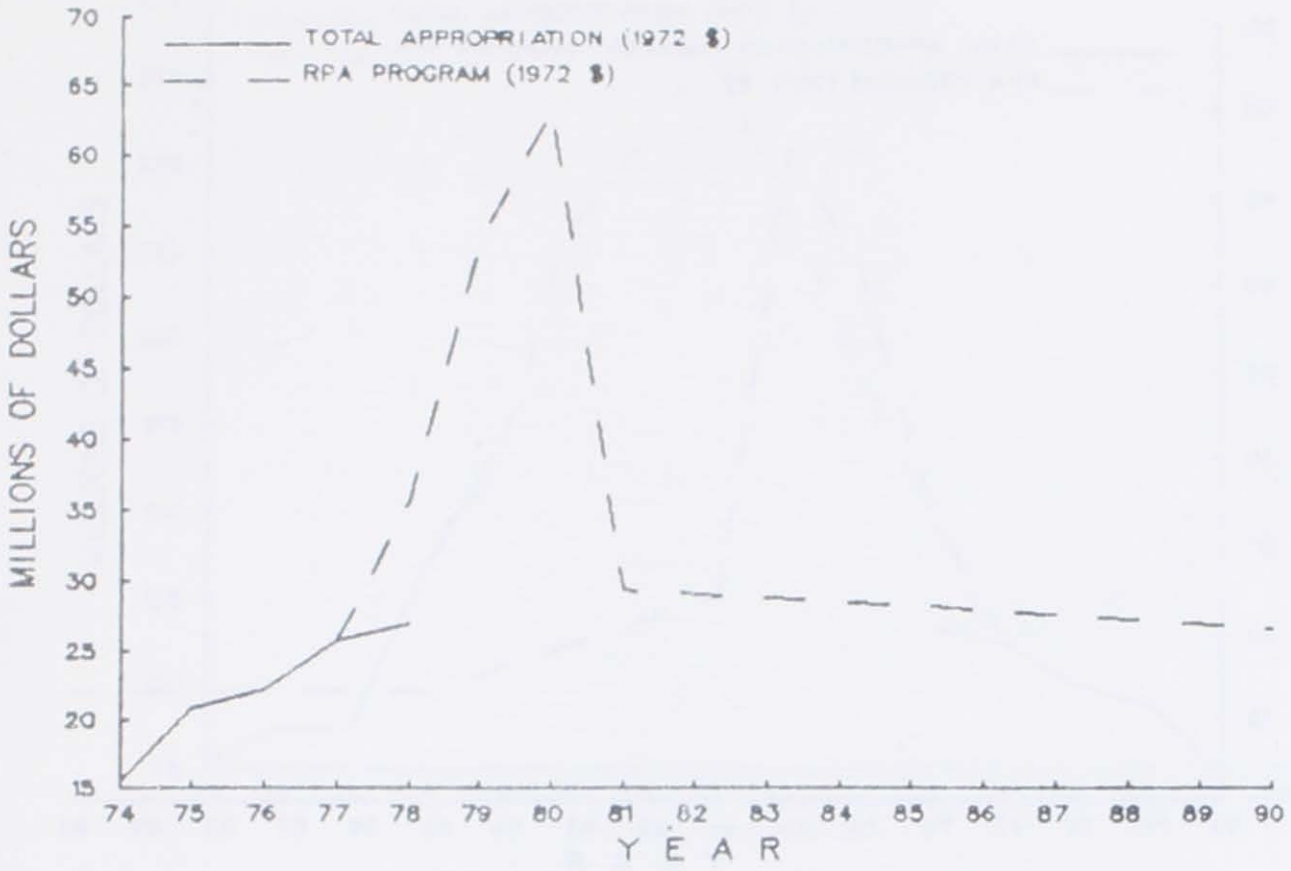


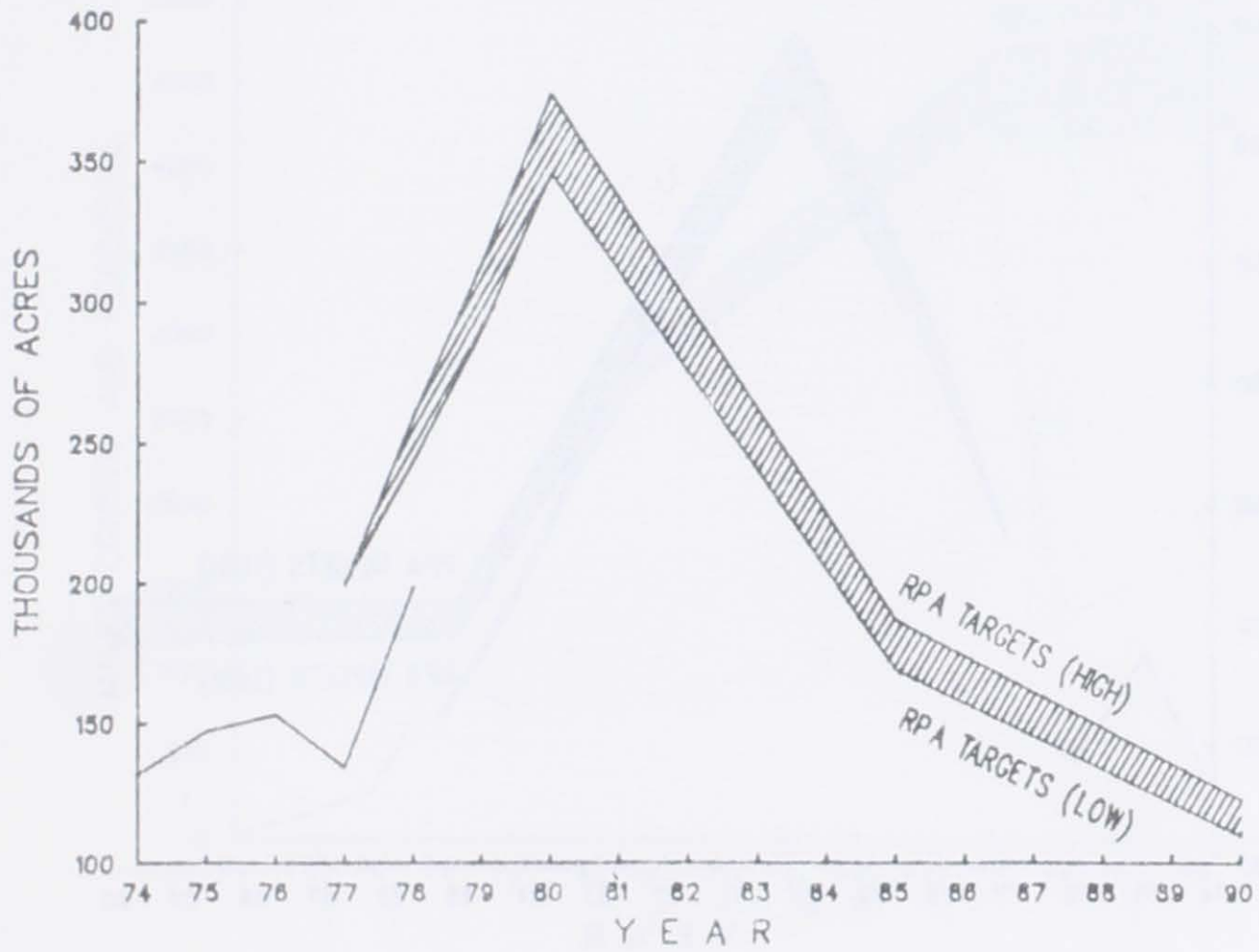
FIGURE 4

REFORESTATION



APPROPRIATED FUNDS ONLY

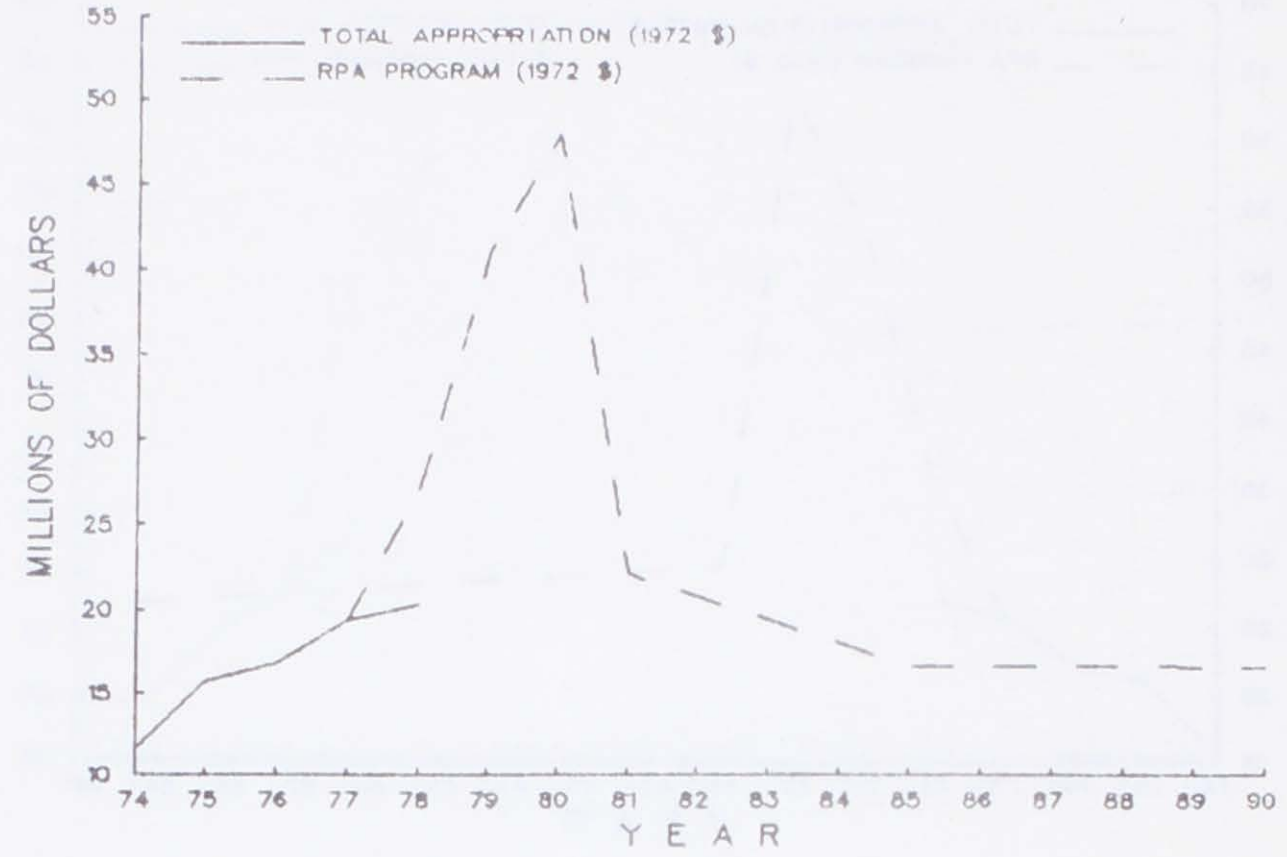
REFORESTATION



APPROPRIATED FUNDS ONLY

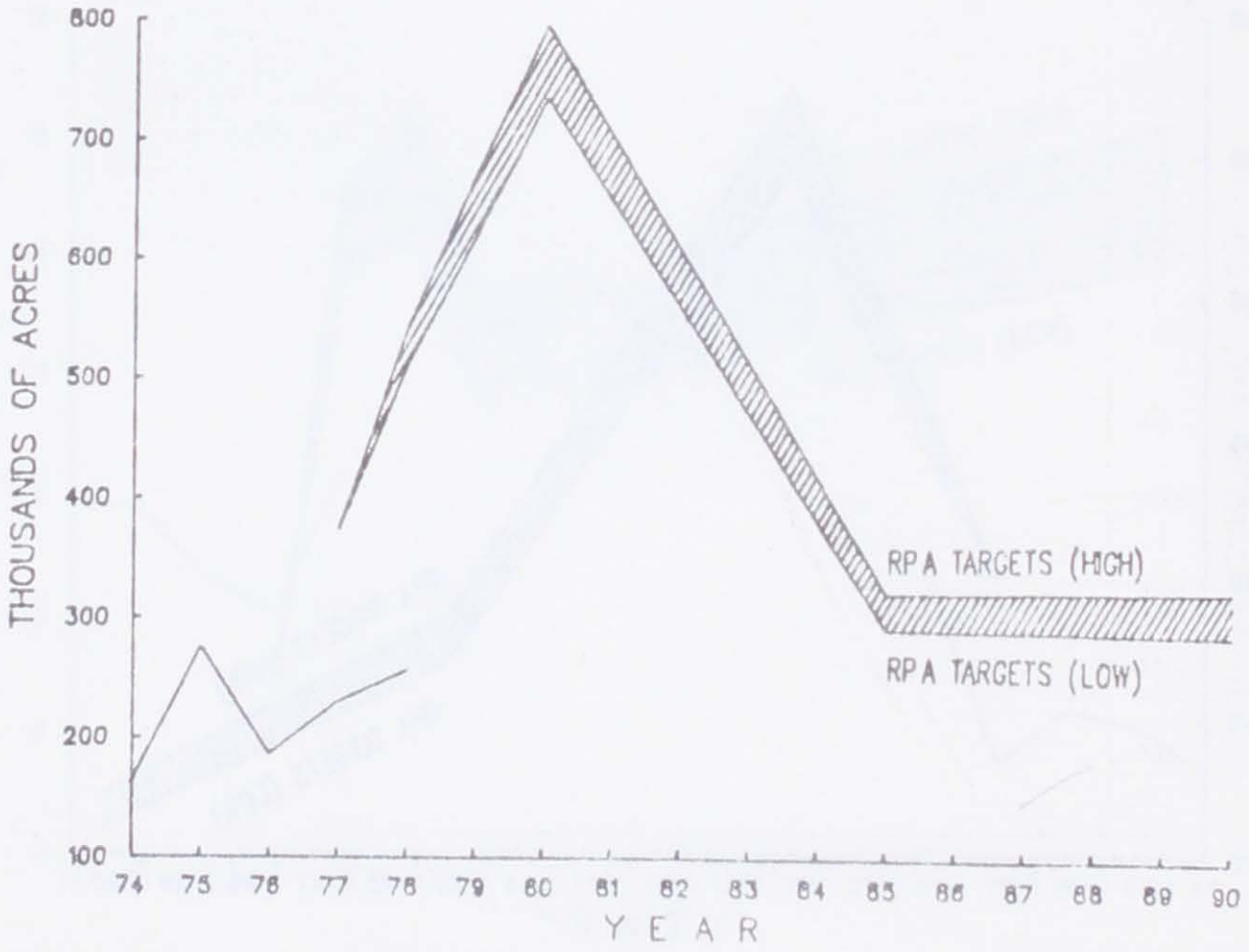
FIGURE 5

TIMBER STAND IMPROVEMENT



APPROPRIATED FUNDS ONLY

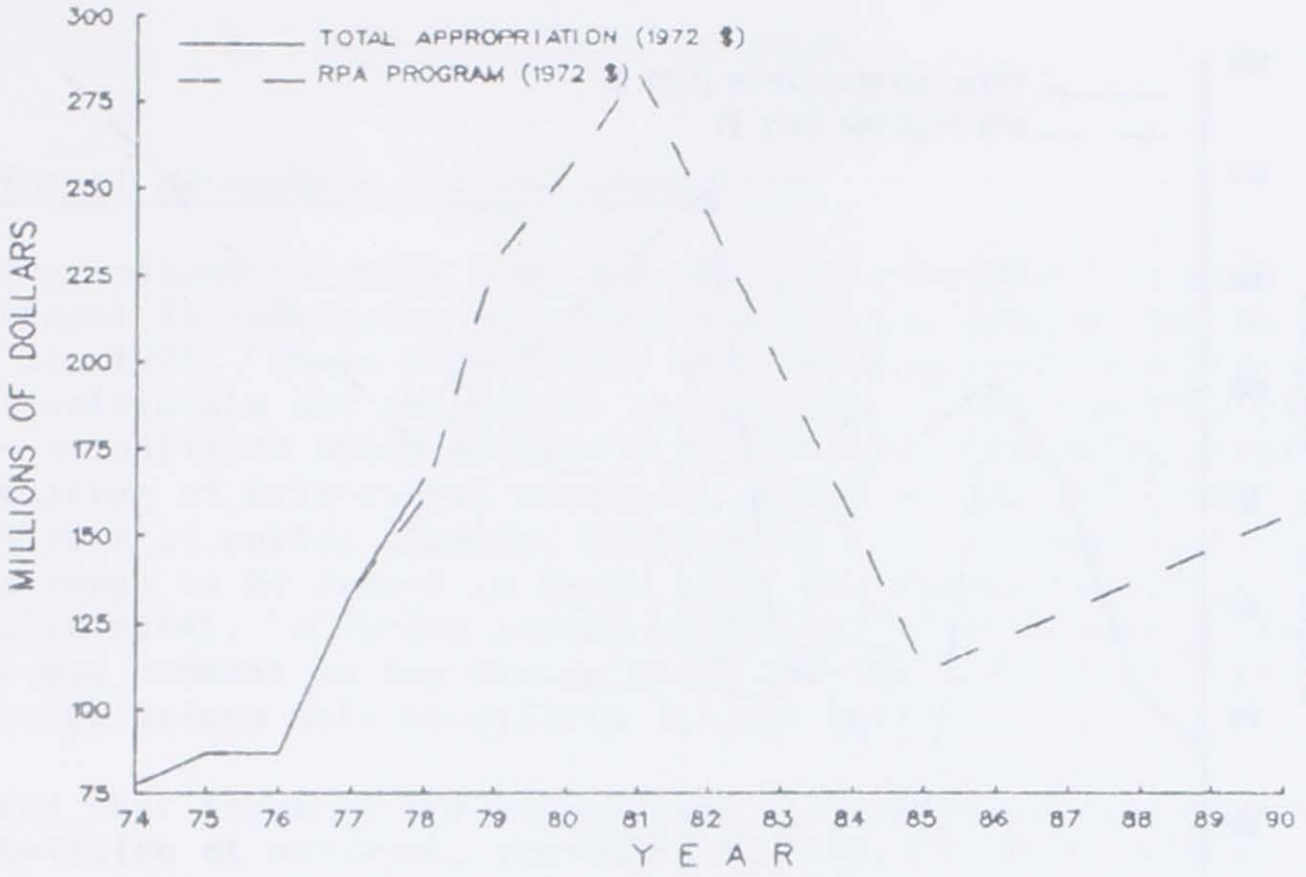
TIMBER STAND IMPROVEMENT



APPROPRIATED FUNDS ONLY

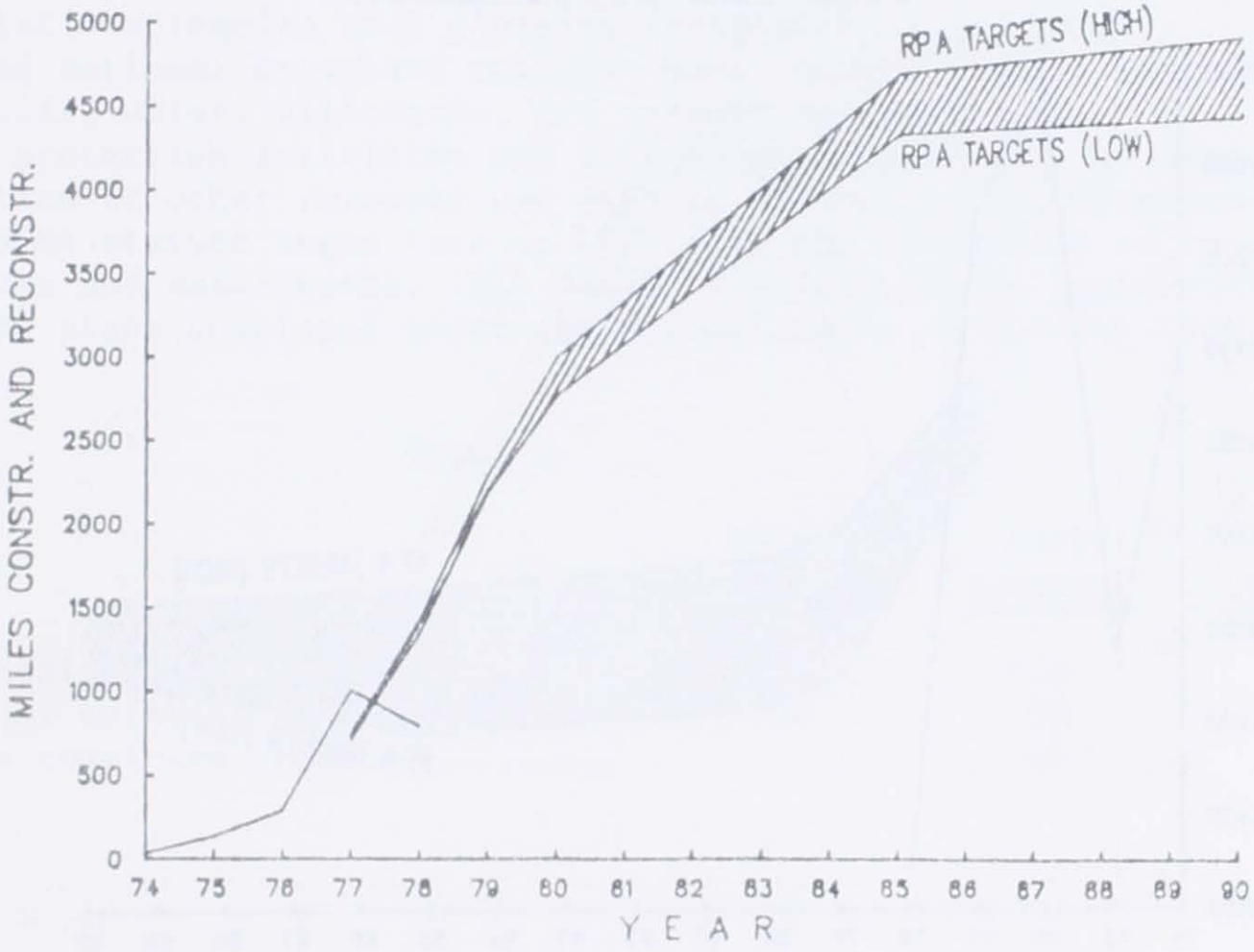
FIGURE 6

FOREST ROADS AND TRAILS CONSTRUCTION



APPROPRIATED FUNDS ONLY

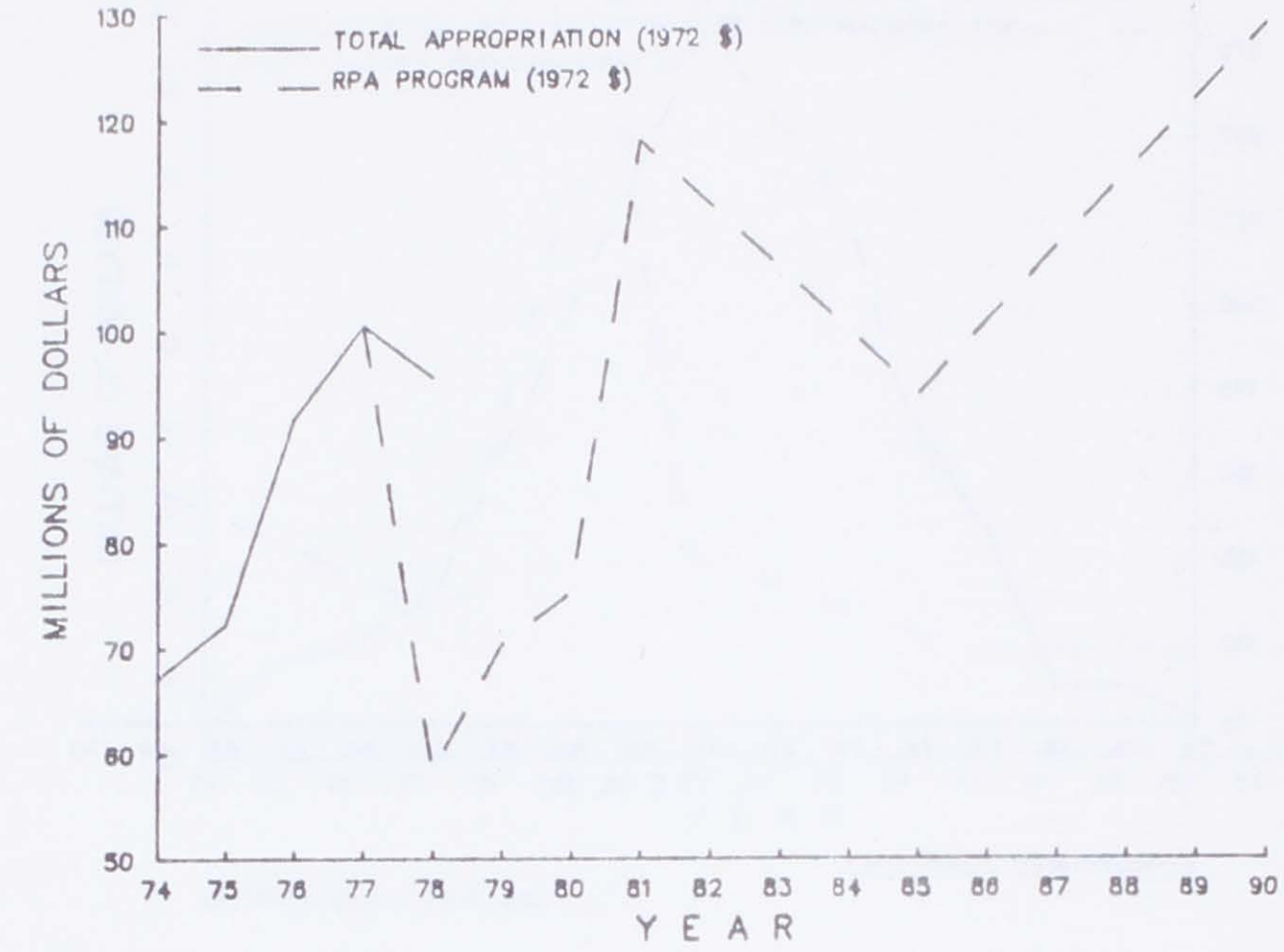
FOREST ROADS AND TRAILS CONSTRUCTION



APPROPRIATED FUNDS ONLY

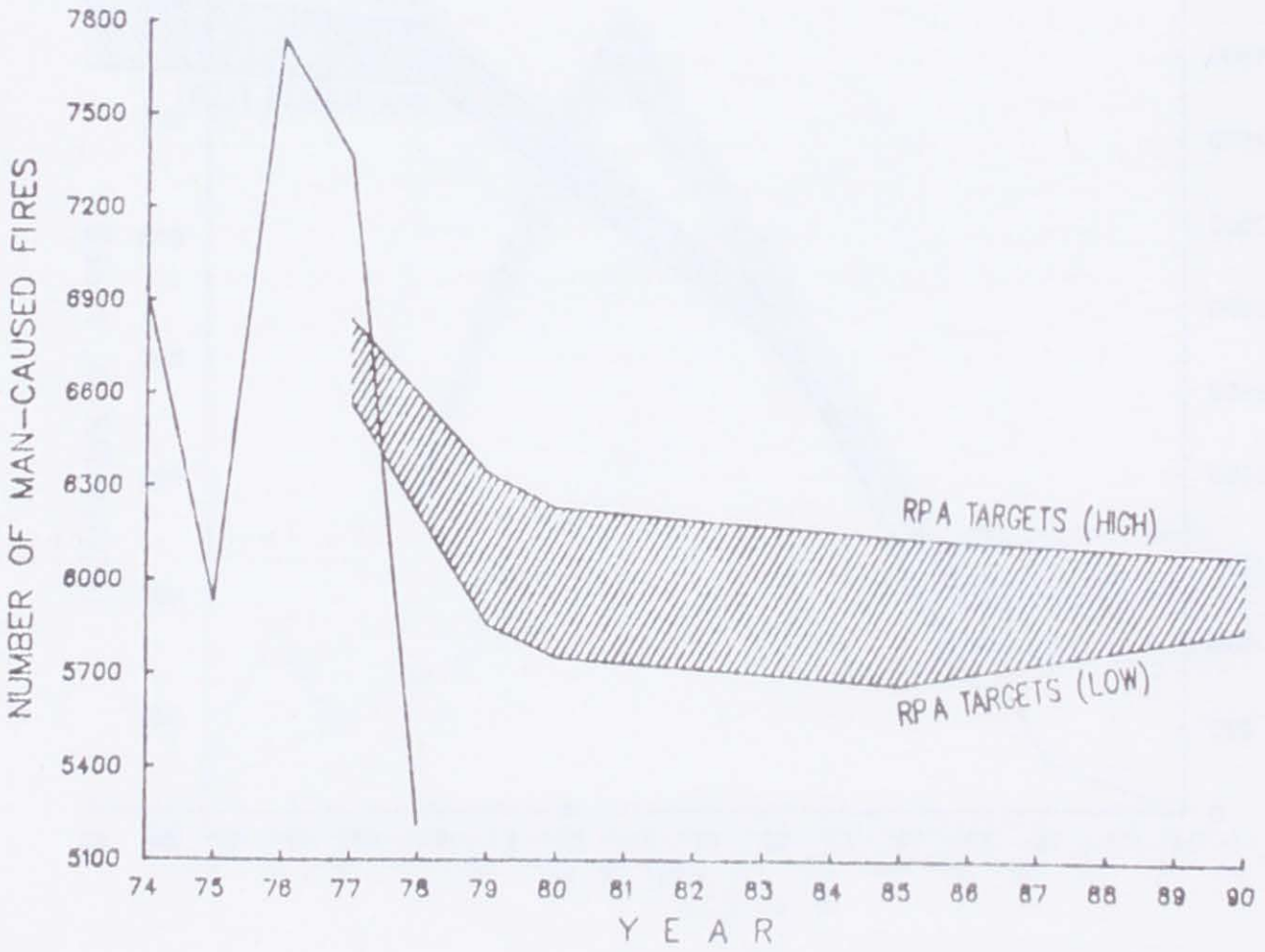
FIGURE 7

FIRE PRE-SUPPRESSION



INCLUDES P&M AND FFF

FIRE PRE-SUPPRESSION



INCLUDES P&M AND FFF

III. SPECIAL ITEMS

A. LAND MANAGEMENT PLANNING

National Forest Management Act Implementation

Proposed regulations to guide land and resource management planning in the National Forest System were published in the Federal Register of August 31, 1978. These regulations are the result of consultation with many individuals and the advice and guidance of a Committee of Scientists established under section 6 of the Act. Following review of the Committee of Scientists' technical report to the Secretary and an analysis of public comment, preparation of a second draft of the regulations, to be issued in March 1979, was determined to be in the public interest. A 60-day review period will follow during which the public may comment on the second draft and the Committee's report. The final regulations will be written in June 1979.

The statutes that required the regulations also required the establishment and revision of national, regional, and local resource goals, based on a periodic assessment of the future supply and demand of renewable resources from both public and private forests and rangelands. Achievement of these goals is the purpose of the planning process provided in these regulations. These acts also require that the public participate in the development, review and revision of land and resource management plans, and that these plans be coordinated with those of State and local units of government and other Federal agencies.

The regulations require that planning integrates all National Forest and National Grassland resource uses--timber, range, fish and wildlife, water, wilderness, and recreation resources--with resource protection activities and fire management activities, and coordination of other resource use such as minerals. Planning under the new NFMA statute began late in 1978 with the collection of resource inventories and assessments. All National Forest System lands will be covered by plans developed under these regulations by October 1985.

TABLE 3

	1978 Actual	1979 Estimate	1980 Estimate
Total planning units (number.....	154	154	154
Revision of existing plans (number)..	34	20	10
New plans completed (number).....	-	10	26

B. ECONOMIC ANALYSIS SUMMARY

One important criterion in evaluating any public program is efficiency. The economic efficiency of a public program can be evaluated by a benefit-cost analysis. The following summary (table 4), using benefit-cost analysis, is an attempt to evaluate the 1978 RPA Recommended Program and the 1978 Actual Accomplished Program.

This analysis uses the present net worth concept. Present net worth means the present value of future benefits less future costs discounted at 10 percent discount rate. This was the technique used in the 1975 RPA Program.

Effective evaluation of program benefits requires that consistent evaluation concepts be used for both the Recommended Program and the actual 1978 program. To get this consistency, the 1980 RPA output values were used. These values were developed under Cooperative Research Agreements with various universities. Tables of these values and the concepts of methodology used are included in the Appendix.

The following summary of present net worth features dollar values for each total system. The recommended and actual programs are compared. In this analysis three factors must be remembered. (1) Only the primary outputs and induced outputs were multiplied by their respective values for each system. (2) The costs are the direct project costs plus the the support costs necessary to provide targeted system outputs. (3) The RPA Recommended Program was not fully funded in all systems (see present worth costs in each system).

The summary results indicate that the Recommended RPA Program was accomplished at the 84 percent level for present worth benefits (actual cost divided by Recommended Program cost). Funding for the 1978 actual program was at 85 percent of total RPA program; however, after inflation is taken into consideration, the funding was about 74 percent of the Recommended Program.

The actual FY 1978 accomplishment shows a benefit/cost ratio of 6.6 to 1 compared to the RPA Recommended Program estimates of 5.8 to 1. That is, for every dollar spent in FY 1978, approximately $6.50 were returned in the form of benefits. This conclusion, however, is somewhat misleading because not all expenditures made in FY 1978 resulted in benefits during that year, while some of the benefits displayed for FY 1978 were the result of investments made in prior years. Even though this display is not without fallacies, it does allow one to look at the relative difference between the RPA Recommended Program and a summary of the actual FY 1978 accomplishments. This comparison between the estimated RPA Recommended Program and the actual FY 1978 figures is made by converting accomplishments to a common base (dollars) and holding as many things constant between the RPA estimate and FY 1978 actual accomplishment (same benefit value for both).

Recreation is the only component element to display an increase in present worth costs and a decrease in present worth benefits. The decrease in present worth benefits is caused by the distribution of recreation activities actually experienced in FY 1978 compared to the RPA estimated distribution of recreation activities. The RPA program estimates project an increase from 1975 over time in the amount of dispersed recreation use, which has a higher average benefit value than does developed recreation activity. Although the total recreation use experienced in FY 1978 was greater than even the RPA high estimate, the proportion of dispersed use was not as high as anticipated. Because the value for developed recreation activities for some regions is half that of the average dispersed recreation activities, the larger proportion of developed recreation use and lower value combine to show a lower actual FY 1978 present worth benefits value.

The $9 million difference in present worth cost shown for recreation was because capital investments were in improvements such as campground construction or reconstruction, that will result in benefits in future years rather than in immediate benefits.

The Wilderness System comparison of estimated and actual present worth figures leads one to believe that dollars do not affect the resulting benefits. In the short run this is true. Short of limiting wilderness use, the Forest Service has limited control on total wilderness use In the long run, however, benefits are affected by the costs spent on the wilderness system. Without proper maintenance and administration, over time the benefits received from the wilderness system could decline.

The Wildlife and Fish System show a 17 percent reduction in the present worth cost estimates from the RPA Recommended Program to the actual FY 1978. At the same time, present worth benefits show a decline of 25 percent between the estimated RPA Program and the FY 1978 actual. This disproportionate reduction in present worth benefits in relation to the decrease in present worth costs can be attributed mainly to the distribution of wildlife activities that actually occurred in FY 1978, as compared to the distribution of activities estimated under the RPA Recommended Program. A shift toward the lower valued activities occurred in FY 1978 even though the actual use was approximately equal to the estimated use. Part of the decline in estimated benefits also can be attributed to the 16 percent reduction in investment.

The Range System shows essentially the same level of benefit for both the estimated and the actual, however, present worth costs show a decrease of 66 percent from the Recommended Program estimate to the actual FY 1978 figures. This condition can be explained by the fact that the difference in costs scheduled under the Recommended

Program for 1978 were for capital investments aimed at improving range quality and increasing future outputs. The actual FY 1978 accomplishment shows a much higher present net worth than estimated in RPA. Again, it might be pointed out that there are pitfalls in making evaluations of single years when multi-year investments are concerned.

The Timber System displays a decrease in the present worth benefit of 10 percent while the present worth costs decreased 27 percent from the estimated to the actual. The majority of this discrepancy can be explained by the fact that timber sales actually sold in 1978 were prepared (the investment made) in prior years.

Within the Land and Water System, the present worth costs display a decrease of 40 percent while present worth benefits decrease only 26 percent. This unequal distribution can be explained by the lack of influence on funding for a number of items within this system. The water output, valued per thousand acre feet, from National Forest land each year is approximately the same. (This could account for the decline in present worth benefits.) The minerals output, also included within the Land and Water System, was more active in FY 1978 than had been anticipated. These two factors were the largest contributors to the present worth benefit declining disproportionately to the costs.

Land management planning regulation development guidelines are being established to provide a common framework for looking at long term effects of costs and benefits for these issues. Full implementation of this concept is not expected to be completed until after the land management plans are completed.

TABLE 4

Economic Analysis Summary
Present Worth Values of RPA Recommended Program and 1978 Program

Resource System	Economic Indicator	Present Worth Value 2/3/ 1978 MM $	
		RPA Recommended Program	FY 1978 Actual
Recreation	Present Worth Benefits 4/(PW Benefits)	1,718	1,458
	Present Worth Costs (PW Costs)	110	119
	Present Net Worth (Net PW)	1,608	1,339
Wilderness	PW Benefits	108	139
	PW Costs	9	9
	Net PW	99	130
Wildlife & Fish	PW Benefits	791	592
	PW Costs	36	30
	Net PW	755	562
Range	PW Benefits	109	108
	PW Costs	105	35
	Net PW	4	73
Timber	PW Benefits	3,281	2,956
	PW Costs	980	718
	Net PW	2,301	2,238
Land & Water 1/	PW Benefits	2,661	1,965
	PW Costs	226	159
	Net PW	2,435	1,806
Human & Community Development	PW Benefits	51	33
	PW Costs	46	30
	Net PW	5	3
	Total Present Net Worth = (MM$)	7,207	6,151
	Benefit/Cost Ratio	5.77	6.59

1/ Soil element is included.
2/ Discounted at 10 percent.
3/ All figures are rounded.
4/ Output values are taken from Report of the 1980 Evaluation Work Group.

C. SAMPLE TIMBER SALES

Section 6 of the Renewable Resources Planning Act requires within an annual report the "identification on a representative sample basis of those advertised timber sales made below the estimated expenditures for such timber as determined by the above cost process." The following section provides, on a sample basis, government expenditures for timber sales sold in FY 1978 and returns to the governmnet resulting from the harvest of timber sold.

For the selected sample of timber sales, all government expenditures attributable to the preparation and sale, administration of harvest, and assessment of timber volumes were identified and estimated. Included were costs that were incurred prior to FY 1978, costs incurred during FY 1978, and costs estimated to occur after FY 1978 until the time all scheduled work is complete on the sales areas.

Also, for these selected sales, returns to the government from the harvest of the timber were estimated. Included were the expected stumpage receipts, timber stand improvement deposits, and the constructed value of the road access.

The principal reason for selling timber was either (1) to salvage harvest mortality timber, (2) to improve short-range and long-term growth by meeting the silvicultural needs of individual stands of timber, or (3) consider the needs of the community and the timber purchaser, who are dependent on National Forest timber sales.

TABLE 5

TIMBER SALES IN FISCAL YEAR 1978, SORTED INTO FIVE GENERAL GROUPS

Group	Sale Preparation and Development Costs	Immediate (Short-Range Returns to Government
One 1/	Low to moderate	Moderate to high
Two 1/	High	Moderate to high
Three 1/	Low to high	Lower than costs
Four 2/	Low to moderate	Moderate and greater than costs
Five 2/	Low to high	Usually minimum and lower than costs

To meet silvicultural objectives on the North Mesa sale area, San Juan National Forest, a three-stage cut is required. The first stage of the sale indicates a return/expenditure ratio of 0.7:1 due to high roading cost applied to the one sale. The same road system will be used to remove the timber from the two subsequent sales, resulting in an overall return/expenditure greater than 1.0.

The Bonita North fire sale on the Sequoia National Forest is a salvage operation where the timber would be lost through deterioration if it is not harvested. Although the sale shows a return/expenditure of 0.4, there is a strong demand and dependency on the Sequoia National Forest timber sales by both the local community and timber purchasers.

1/ Timber is selected for sale to improve growth and yield of the forest by meeting individual timber stand silvicultural needs and working circle planning goals, such as improvement of age class distribution.

2/ Timber is selected for sale for salvage harvest for mortality.

TABLE 6

DATA FOR TIMBER SALES REPRESENTATIVE OF EACH OF THE FIVE GROUPS IN TABLE 5

ITEM	GROUP ONE	TWO	THREE	FOUR	FIVE
	---Improve Growth and Yield ---			---Salvage of Mortality---	
Region	Pacific NW	Eastern	Rocky Mtn	Alaska	Pacific SW
National Forests	Gifford Pinchot	Allegheny	San Juan	Tongass	Sequoia
Sale name	Siler VI	Big Buck	North Mesa	Painted Peak	Bonita North Fire
Volume sold (thousand board feet)	20,000	1,076	4,554	4,350	6,880
Government expenditures (dollars in thousands)					
Timber resource	$ 25.4	8.8	42.2	33.0	97.7
Transportation system	79.6	30.7	107.6	1.0	6.6
All other resources	8.3	1.2	4.5	3.5	20.7
Total expenditures	$ 113.3	40.7	154.3	37.5	125.0
Returns to government (dollars in thousands)					
Stumpage receipts and stand improvement deposits	$ 5,542.2	43.6	8.9	205.5	16.7
Value of constructed road access	166.1	40.2	93.0	-	37.8
Total returns	$ 5,708.3	83.8	101.9	205.5	54.5
Averages per thousands board feet (dollars)					
Expenditures	$ 5.67	37.82	33.88	8.62	18.17
Returns	285.41	77.88	22.37	47.24	7.92
Return/expenditures ratio	50.3	2.1	0.7	5.5	0.4

D. CERTIFICATION OF TREATED LANDS AND REFORESTATION AND TIMBER STAND IMPROVEMENT NEEDS

1. Land Inventory Data

There is continued progress in obtaining firm land inventory data for reforestation and timber stand improvement (TSI) in a result of increased emphasis on this feature of the silviculture program. In fiscal year 1978, 6,674,000 acres of land were examined and prescriptions for them prepared.

All lands identified as in need of reforestation and TSI have been reported by State, National Forest, and productivity class (tables 7 and 8). By the end of fiscal year 1979, all backlog reforestation acres will have been examined and a diagnosis of treatment prepared. Full prescriptions will not be prepared until needed on those acres scheduled for reforestation later in the period. The objective is to prepare firm prescriptions for all lands that need treatment as close to the treatment period as possible.

2. Reforestation and TSI Needs and Program

The National Forest Management Act requires the Secretary to:

1. Publish regulations to guide land and resource planning in the National Forest System, and by 1985, have all lands covered by plans prepared in accordance with the planning guidelines.

2. Formulate and implement, as soon as practicable, a process for estimating the long-term costs and benefits of reforestation and TSI, and the intensified management practices.

3. Identify by September 30, 1985, lands not suitable for timber production because of economic or physical factors and include this information in land management plans.

4. Identify and report to Congress annually, beginning with FY 1978:

   -- the amount and location of all National Forest lands where land management plans indicate the need for reforestation and TSI;

   -- an estimate of the funds needed for reforestation and TSI of National Forest lands to be cut over during the year, plus an estimate of the funds needed to eliminate the backlog within the 8-year period, FY 1978-85.

Meeting these requirements has proven to be difficult for three basic reasons. First, land management planning policies and procedures pursuant to the National Forest Management Act (NFMA) have not yet been firmly established. Proposed land management planning regulations were published on August 31, 1978, another set of proposed regulations will be published in March 1979, and final regulations will be published later. The explicit policies and procedures for estimating long-term costs and benefits of reforestation and TSI, and the criteria to be used in identifying lands not suitable for timber production, are being developed in the context of the promulgation of the land management planning regulation.

Secondly, the acreage data on reforestation and TSI needs has not been confirmed by on-the-ground examination of all the areas included in the estimate. Earlier estimates made in 1968 were based on cursory inventories and rough field estimates. Starting in 1973, the Department has made annual reports reflecting an intensified program of stand and site examination to determine the present condition of the lands in need of treatment. Even so, probably 15 percent of the area reported in need of reforestation and more of the TSI area has not had a recent on-the-ground examination by a qualified silviculturalist. The General Accounting Office and the Forest Service recognize these shortcomings. The Forest Service has made a commitment to complete on-site examinations on all lands in the reforestation backlog category by the end of the FY 1979, and in July of last year, the Forest Service adoped an action plan to improve evaluation and management of the reforestation and TSI program. Our experience has been that when on-the-ground examinations are conducted, some of the land first reported to be in need of treatment is found to be satisfactorily stocked, or is in an area that will become stocked by natural means, or is in an area that for economic or other forest resource management reasons should not be treated in the foreseeable future.

Reforestation and TSI are capital investment opportunities. Judgments on the most appropriate annual and long-term funding levels for these programs should be based primarily on the returns one is seeking from capital investments in the context of all National Forest resource management objectives and uses. Improvements in benefit-cost information to support reforestation and TSI planning at all levls is an important objective of the Forest Service in FY 1979. Cost effectiveness of available opportunities for investment measures in FY 1980 was an important consideration in developing the FY 1980 budget estimates, and will be an even more important consideration in the future as the data base is improved.

It should be clearly understood that the following estimates of needs and costs, and the schedule for accomplishing these needs, do not represent a fixed Departmental proposal for a reforestation and TSI program for the future. The ultimate recommended long-range program will be developed on the basis of emerging land management planning policies and procedures and on the basis of improved site-specific information on costs and returns of known investment opportunities, and non-timber resource needs and uses.

Reforestation and TSI needs as of September 30, 1978, are:

Backlog reforestation	1,435,232
Current reforestation needs	743,558
TOTAL	2,178,790
TSI needs	2,611,829

Projection of the treatment period is identified in Tables 9 and 10. Of the 1,435,232 acres of reforestation backlog, 494,792 acres have been identified for possible reforestation beyond 1984 for the following reasons:

1. Some acres of need are currently in RARE II or wilderness study units with resulting delay of treatment.

2. Some acres are not sound investments in relation to timber production at the present time.

3. Some acres are expected to be economically inaccessible until after 1984. Such areas would require heavy equipment in roadless areas and costly transportation for men and trees.

4. Some units have large acreages. There is a limit to the number of acres that can be treated each year. Giving priority to the most productive sites will delay the reforestation of some less productive sites.

3. Cost of Land Treatment

The program to accomplish the present estimate of the known needed work is presented below.

Item	Acres	Appropriated (Dollars)	Acres	K-V (Dollars)
Total reforestation	1,711,266	412,693,000	467,524	106,513,000
Backlog	1,359,115	351,204,000	76,117	17,994,000
Current	352,151	61,489,000	391,407	88,519,000
Total TSI	2,003,619	248,487,000	608,210	56,123,000

The above table is based on existing inventories and records that reflect the expected current costs. The estimates in some situations,

especially TSI, lack site specific data. Costs include the tree improvement and nursery program's for 5 years and all administrative overhead, as well as the programs share of land planning and environmental coordination. It does not include the costs of other functional assistance to the planning and coordination process. Also, not included are acres and costs to implement Section 4 of the National Forest Management Act of 1976 that requires establishing and improving the National Forests through reforestation and TSI for enhancement of multiple uses other than timber.

Costs estimates by fiscal years are provided in Tables 9 and 10.

4. Certification of Treated Lands

Procedures for standardizing the methods of examining and certifying treated lands were implemented during fiscal year 1978. Success in reforestation programs generally can be certified only after third-year examinations. Failures are noted and the area returned to a category where reforestation work is needed after first- and/or third-year examinations. Certification or failure of TSI treatments can be made after first- and/or third-year examination.

Certified for FY 1978	Acres
Planting and seeding	135,078
Natural regeneration	146,193
Total reforestation	281,271
TSI	272,251

5. Improved Fund Allocation

The field offices are now preparing the budget programing advice by site productivity for review by the Washington Office. Thus, site productivity is a consideration at Forest, Region, and Washington Office levels. This provides more flexibility in programing TSI targets to Regions. There still are some constraints in flexibility, however. Forests and Ranger Districts are still limited, by contractor availability and personnel ceilings, in the size of program they can manage each year.

There is less flexibility at the Washington Office level in adjusting reforestation targets by site productivity. The Regions are constrained by nursery capacity for each Region, and seeds must be sown at least 2 years prior to the appropriation year in which the trees are to be planted. The Forests and Regions must make planning decisions and consider productivity classes at the time of sowing. National direction is that site productivity and growth potential will be major elements in the planning process.

TABLE 7 STATUS OF REFORESTATION NEEDS - SEPTEMBER 30, 1978
By State and National Forests by Productivity Class

	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRE
Alabama			(15,636)	(10,417)	(260)	(26,313)
Alaska	Stikine				14,785	14,785
	Chatham				19,496	19,496
	Chugach		635			635
	Ketchikan				10,173	10,173
	TOTAL		(635)		(44,454)	(45,089)
Arizona	Apache-Sitgreaves	6,005	15,144	1,320		22,469
	Coconino	10,328	24,348			34,676
	Coronado		70			70
	Kaibab	3,693	6,782			10,475
	Prescott		4,841			4,841
	Tonto	139	402			541
	TOTAL	(20,165)	(51,587)	(1,320)		(73,072)
Arkansas	Ozark-St. Francis		9,534	3,178		12,712
	Ouachita		30,119	3,722	324	34,165
	TOTAL		(39,653)	(6,900)	(324)	(46,877)
California	Angeles		3,822			3,822
	Cleveland		164			164
	Eldorado		1,051	1,110	205	2,366
	Inyo		781	84		865
	Klamath	12,540	7,386	3,296	7,108	30,330
	Lassen	96	1,086	436	6	1,624
	Los Padres	219	239	20		478
	Mendocino	268	1,406	939	100	2,713
	Modoc	4,232	13,747	35		18,014

TABLE 7 STATUS OF REFORESTATION NEEDS - (Continued)

	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRE
California (Cont.)	Plumas	229	3,933	4,154	1,851	10,167
	Rogue River			572		572
	San Bernardino	1,211	141	98		1,450
	Sequoia	217	4,413	4,079		8,709
	Shasta-Trinity	1,391	27,807	38,670	9,141	77,009
	Sierra	46	2,360	2,372	584	5,362
	Siskiyou		202	505	167	874
	Six Rivers		4,971	10,040	4,248	19,259
	Stanislaus		3,255	8,171	3,822	15,248
	Tahoe	503	6,008	4,046	1,980	12,537
	Toiyabe	1,919				1,919
	TOTAL	(22,871)	(82,772)	(78,627)	(29,212)	(213,482)
Colorado	Arapaho-Roosevelt		9,385			9,385
	Grand Mesa-Uncompahgre	47,961	25,825	30,326		104,112
	Gunnison					
	Manti-LaSal		569			569
	Pike-San Isabel	6,906	5,489			12,395
	Rio Grande	10,105	63,545	9,724		83,374
	Routt	4,803				4,803
	San Juan		89,258			89,258
	White River	4,620	5,300	1,100		11,020
	TOTAL	(74,395)	(199,371)	(41,150)		(314,916)
Florida		(19,062)	(10,217)	(8,474)	(1,088)	(38,841)
Georgia	Chattahoochee-Oconee	(184)	(3,602)	(2,525)	(522)	(6,833)
Idaho	Boise	11,039	36,195	4,424	208	51,866
	Caribou		1,309	561		1,870
	Challis	604	284			888
	Clearwater	63	31,012	20,347	123,120	174,542
	Nezperce	150	16,654	6,077	10,635	33,516
	Panhandle		2,837	20,597	61,708	85,142
	Payette	3,380	4,914	541		8,835
	Salmon	5,478	6,998	679		13,155
	Sawtooth	448	3,473	211		4,132
	Targhee	5,823	13,807			19,630
	TOTAL	(26,985)	(117,483)	(53,437)	(195,671)	(393,576)

TABLE 7 STATUS OF REFORESTATION NEEDS - (Continued)

	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES
Illinois	Shawnee		(753)			(753)
Indiana	Hoosier		(2,339)	(1,324)	(751)	(4,414)
Kentucky	Daniel Boone	(734)	(5,569)	(1,436)	(751)	(8,490)
Louisiana	Kisatchie	(79)	(688)	(4,548)	(8,762)	(14,077)
Maine	White Mountain					
Michigan	Hiawatha	324	679	35	4	1,042
	Huron-Manistee	3,108	7,022	1,304	594	12,028
	Ottawa		2,400	575		2,975
	TOTAL	(3,432)	(10,101)	(1,914)	(598)	(16,045)
Minnesota	Chippewa	3,534	2,428			5,962
	Superior		54,168			54,168
	TOTAL	(3,534)	(56,596)			(60,130)
Mississippi		(75)	(2,898)	(7,382)	(6,221)	(16,576)
Missouri	Mark Twain		(12,753)			(12,753)
Montana	Beaverhead	1,457	10,700	1,580		13,737
	Bitterroot	1,002	4,057	5,618	24	10,701
	Custer	1,964	434			2,398
	Deerlodge	4,285	6,669	119		11,073
	Flathead	677	6,467	21,295	7,096	35,535
	Gallatin	5,325	4,476	317	58	10,176
	Helena	778	13,324	2,169	8	16,279
	Kootenai	2,600	17,930	78,851	17,495	116,876
	Lewis and Clark	227	7,583			7,810
	Lolo	4,340	39,721	24,095	4,346	72,502
	TOTAL	(22,655)	(111,361)	(134,044)	(29,027)	(297,087)

TABLE 7 STATUS OF REFORESTATION NEEDS - (Continued)

	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES
Nebraska						
Nevada	Humboldt					0
	Toiyabe	400				400
	TOTAL	(400)				(400)
New Hampshire	White Mtn.		(225)	(180)	(60)	(465)
New Mexico	Carson	8,862	6,750			15,612
	Cibola	1,774	1,917			3,691
	Gila	2,201	8,430			10,631
	Lincoln	1,215	5,492			6,707
	Santa Fe	8,600	1,553			10,153
	TOTAL	(22,652)	(24,142)			(46,794)
North Carolina		(66)	(3,436)	(2,998)	(9,332)	(15,832)
Ohio	Wayne		(2,000)	(788)		(2,788)
Oklahoma	Ouachita		(3,137)		(621)	(3,758)
Oregon	Deschutes	7,349	13,845	3,297		24,491
	Fremont	14,339	4,161			18,500
	Malheur	1,105	2,000			3,105
	Mount Hood	686	4,522	11,308	4,117	20,633
	Ochoco	3,037	468	413		3,918
	Rouge River		516	15,194		15,710
	Siskiyou	339	8,769	19,258	14,164	42,530
	Siuslaw	1,735	1,430		6,502	9,667
	Umatilla	553	12,540	2,872		15,965
	Umpqua	827	4,541	10,341	3,303	19,012
	Wallowa-Whitman	41,825	9,794	402	66	52,087
	Willamette	45	1,481	16,200	15,589	33,315
	Winema	7,446	19,029	19,677	208	46,360
	TOTAL	(79,286)	(83,096)	(98,962)	(43,949)	(305,293)

TABLE 7 STATUS OF REFORESTATION NEEDS - (Continued)

	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES
Pennsylvania	Allegheny			(1,580)	(100)	(1,680)
Puerto Rico	Caribbean		(1,222)			(1,222)
South Carolina			(2,746)	(1,829)	(1,751)	(6,326)
South Dakota	Black Hills	(400)				(400)
Tennesse	Cherokee	(33)	(1,756)	(542)	(251)	(2,582)
Texas				(16,787)		(16,787)
Utah	Ashley	699	576			1,275
	Dixie		3,483			3,483
	Fishlake	941				941
	Manti-LaSal		615			615
	Sawtooth					
	Uinta	10	39	122		171
	Wasatch	2,497	437			2,934
	TOTAL	(4,147)	(5,150)	(122)		(9,419)
Vermont	Green Mtn.	(1,800)	(149)	(200)		(2,149)
Virginia	George Washington	430	769	55	151	1,405
	Jefferson	199	956	305	548	2,008
	TOTAL	(629)	(1,725)	(360)	(699)	(3,413)

TABLE 7 STATUS OF REFORESTATION NEEDS - (Continued)

	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES
Washington	Colville	478	21,884	4,546	38	26,946
	Gifford Pinchot	2,481	12,321	24,777	2,577	42,156
	Mt. Baker-Snogualmie	225	2,575	7,706	2,266	12,772
	Okanogan	536	929			1,465
	Olympic		479	9,766	10,141	20,386
	Wentachee	7,748	10,091	5,844	451	24,134
	Umatilla		1,697			1,697
	TOTAL	(11,468)	(49,976)	(52,639)	(15,473)	(129,556)
West Virginia	George Washington				25	25
	Monogahela		170			170
	TOTAL		(170)		(25)	(195)
Wisconsin	Chequamegon		3,041	4,300		7,341
	Nicolet		13,458	4,597		18,055
	TOTAL		(16,499)	(8,897)		(25,396)
Wyoming	Bighorn	2,501	781			3,282
	Black Hills					
	Bridger-Teton		6,615	500		7,115
	Medicine Bow	4,551				4,551
	Shoshone					
	Targhee		61			61
	Wasatch	2				2
	TOTAL	(7,054)	(7,457)	(500)		(15,011)
GRAND TOTALS		322,106	926,900	539,882	389,902	2,178,790

TABLE 8 TIMBER STAND IMPROVEMENT NEEDS

		RELEASE					THINNING				
	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES	20-49	50-84	85-119	120+	TOTAL ACRES
Alabama			(682)	(740)	(29)	(1,451)		(1,270)	(157)	(141)	(1,568)
Alaska	Stikine				845	845				5,694	5,694
	Chatham				1,330	1,330				880	880
	Chugach		500			500	75	650	75		800
	Ketchikan				500	500				3,659	3,659
	TOTAL		(500)		(2,675)	(3,175)	(75)	(650)	(75)	(10,233)	(11,033)
Arizona	Apache-Sitgreaves						18,347	124,202	6,545		149,094
	Coconino						19,592	76,164			95,756
	Coronado		934			934		1,312			1,312
	Kaibab						11,758	52,321			64,079
	Prescott		70			70		1,611			1,611
	Tonto						3,229	14,554			17,783
	TOTAL		(1,004)			(1,004)	(52,926)	(270,164)	(6,545)		(329,635)
Arkansas	Ozark-St. Francis		4,675	1,169		5,844		6,348	1,587		7,935
	Ouachita		8,292	398		8,690		13,547			13,547
	TOTAL		(12,967)	(1,567)		(14,534)		(19,895)	(1,587)		(21,482)
California	Angeles							320			320
	Cleveland		355			355		4,677			4,677
	Eldorado		907	1,724	140	2,771		176	408	287	871
	Inyo		108			108		2,440	1,140		3,580
	Klamath	35	5,047	7,787	1,568	14,437	4	8,464	12,876	1,120	22,464

TABLE 8 TIMBER STAND IMPROVEMENT NEEDS - (Continued)

		RELEASE					THINNING				
	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES	20-49	50-84	85-119	120+	TOTAL ACRES
California (Cont.)	Lassen		1,098	4,792	827	6,717	448	2,285	995	256	3,984
	Los Padres		155			155		801			801
	Mendocino	110	1,039	660	81	1,890	164	1,330	677	45	2,216
	Modoc		1,435			1,435	11,579	11,764	803		24,146
	Plumas	2,618	11,900	8,607	7,174	30,299	349	7,946	5,497	2,238	16,030
	Rogue River			572		572					
	San Bernardino	1,578	72	130		1,780	2,111	711	96		2,918
	Sequoia		567	2,827	50	3,444	80	690	1,650	415	2,835
	Shasta-Trinity	800	3,235	10,993	2,432	17,460	15	2,770	10,370	3,310	16,465
	Sierra		592	516	310	1,418		2,091	4,586	2,037	8,714
	Siskiyou	157	313	52		522	57	108			165
	Six Rivers		5,388	8,000	10,427	23,815			555	6,985	7,540
	Stanislaus		900	2,740	1,361	5,001		252	1,667	1,330	3,249
	Tahoe	313	3,791	5,112	1,310	10,526	457	7,098	3,205	2,139	12,899
	Toiyabe	2,503				2,503	7,750				7,750
	TOTAL	(8,114)	(36,902)	(54,512)	(25,680)	(125,208)	(23,014)	(53,923)	(44,525)	(20,162)	(141,624)
Colorado	Arapaho-Roosevelt							131,487			131,487
	Grand Mesa-Uncompahgre & Gunnison							6,561	2,150		8,711
	Manti-LaSal			1,681		1,681		1,651			1,651
	Pike-San Isabel	310	930			1,240	12,350	37,050			49,400
	Rio Grande						4,150	25,040	4,201		33,391
	Routt		2,000	1,450		3,450	5,750				5,750
	San Juan		1,475			1,475		4,000			4,000
	White River		3,489	827		4,316	3,470	478			3,948
	TOTAL	(310)	(7,894)	(3,958)		(12,162)	(25,720)	(206,267)	(6,351)		(238,338)

TABLE 8 TIMBER STAND IMPROVEMENT NEEDS - (Continued)

		RELEASE					THINNING				
	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES	20-49	50-84	85-119	120+	TOTAL ACRES
Florida			(1,329)			(1,329)	(556)				(556)
Georgia	Chatta-hoochee-Ocanee	(67)	(2,233)	(2,184)	(841)	(5,325)		(362)	(573)	(361)	(1,296)
Idaho	Boise						1,020	4,613	4,995	3,504	14,132
	Caribou		1,761	763		2,524		416	178		594
	Challis						1,973	860			2,833
	Clearwater		70	1,548	17,465	19,083	55	10,416	13,417	32,925	56,813
	Nezperce		315		352	667		8,483	955	436	9,874
	Panhandle		342	691	5,489	6,522	145	2,085	19,672	61,243	83,145
	Payette						141	8,376		2,005	10,522
	Salmon	60	123			183	7,133	7,196	83		14,412
	Sawtooth	71	220			291	299	360			659
	Targhee	747	1,134			1,881	4,734	5,608			10,342
	TOTAL	(878)	(3,965)	(3,002)	(23,306)	(31,151)	(15,500)	(48,413)	(39,300)	(100,113)	(203,326)
Illinois	Shawnee	(4,760)				(4,760)		(13,160)			(13,160)
Indiana	Hoosier		(1,286)			(1,286)	(5,000)	(4,427)			(9,427)
Kentucky	Daniel Boone	(1,264)	(4,207)	(4,779)	(735)	(10,985)	(414)	(13,275)	(9,536)	(1,270)	(24,495)
Louisiana	Kisatchie		(25)	(1,944)	(731)	(2,700)			(1,641)	(3,769)	(5,410)
Maine	White Mountain		(190)	(165)	(45)	(400)		(90)	(87)	(23)	(200)
Michigan	Hiawatha	922	582	97	17	1,618	1,222	772	129	21	2,144
	Huron-Manistee		15,135	2,000		17,135			688		688
	Ottawa		8,350	2,000		10,350		38,878	9,000		47,878
	TOTAL	(922)	(24,067)	(4,097)	(17)	(29,103)	(1,222)	(39,650)	(9,817)	(21)	(50,710)

TABLE 8 TIMBER STAND IMPROVEMENT NEEDS - (Continued)

		RELEASE					THINNING				
	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES	20-49	50-84	85-119	120+	TOTAL ACRES
Minnesota	Chippewa	13,285	8,258			21,543		442			442
	Superior	29,489				29,489		2,801			2,801
	TOTAL	(42,774)	(8,258)			(51,032)		(3,243)			(3,243)
Mississi-ppi		(45)	(1,722)	(923)	(826)	(3,516)	(17)	(521)	(546)	(344)	(1,428)
Missouri	Mark Twain		(15,474)			(15,474)			(7,217)		(7,217)
Montana	Beaver-head						648	1,514	752		2,914
	Bitterroot										0
	Custer		270			270	939	1,006			1,945
	Deerlodge						369	19,443	25		19,837
	Flathead			252		252	16	11,661	21,410	12,678	45,765
	Gallatin	136	778	353		1,267	9,025	8,908	4,006		21,939
	Helena		481			481	2,226	11,769	4,483	40	18,518
	Kootenai		1,107	2,047	1,794	4,948	1,743	26,684	56,238	12,332	96,997
	Lewis and Clark		16			16	164	12,198			12,362
	Lolo		78			78	11,456	8,560	10,227	1,925	32,168
	TOTAL	(136)	(2,730)	(2,652)	(1,794)	(7,312)	(26,586)	(101,743)	(97,141)	(26,975)	(252,445)
Nebraska											0
Nevada	Humboldt	1,025				1,025					
	Toiyabe	300				300	1,000				1,000
	TOTAL	(1,325)				(1,325)	(1,000)				(1,000)
New Hampshire	White Mtn.		(1,700)	(1,432)	(415)	(3,547)		(880)	(717)	(195)	(1,792)

TABLE 8 TIMBER STAND IMPROVEMENT NEEDS - (Continued)

		RELEASE					THINNING				
	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES	20-49	50-84	85-119	120+	TOTAL ACRES
New Mexico	Carson		192			192	13,660	14,643			28,303
	Cibola						15,433	18,731			34,164
	Gila						23,083	78,764			101,847
	Lincoln						1,350	7,032			8,382
	Santa Fe	600	400			1,000	20,500	36,740			57,240
	TOTAL	(600)	(592)			(1,192)	(74,026)	(155,910)			(229,936)
North Carolina			(2,936)	(587)	(2,208)	(5,731)		(1,225)	(366)	(635)	(2,226)
Ohio	Wayne	(3,169)	(2,000)			(5,169)		(4,771)			(4,771)
Oklahoma	Ouachita		(1,809)		(60)	(1,869)		(2,158)		(115)	(2,273)
Oregon	Deschutes		483	860	1,112	2,455	1,777	1,938	13,689	4,653	22,057
	Fremont	531				531	17,427	4,051			21,478
	Malheur	528				528	4,019	8,578			12,597
	Mount Hood		544	2,137	277	2,958	372	1,972	6,105	2,960	11,409
	Ochoco						7,689	1,386	10		9,085
	Rouge River		417	10,920		11,337		17	1,848		1,865
	Siskiyou	1,374	4,698	9,284	10,208	25,564	79	1,172	412	674	2,337
	Siuslaw	368	554		6,242	7,164	697	1,097		5,819	7,613
	Umatilla						2,304	5,241	2,582		10,127
	Umpaqua		1,358	5,381	2,474	9,213		1,930	7,775	1,445	11,150
	Wallowa-Whitman	393	546	131	22	1,092	2,075	12,882	20,784	5,819	41,560
	Willamette			3,860	6,828	10,688			11,295	9,918	21,213
	Winema						3,469	25,078	8,242	353	37,142
	TOTAL	(3,194)	(8,600)	(32,573)	(27,163)	(71,530)	(39,908)	(65,342)	(72,742)	(31,641)	(209,633)
Pennsylvania	Allegheny								(2,119)	(200)	(2,319)

TABLE 8 TIMBER STAND IMPROVEMENT NEEDS - (Continued)

		RELEASE					THINNING				
	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES	20-49	50-84	85-119	120+	TOTAL ACRES
Puerto Rico	Caribbean			(3,108)		(3,108)					
South Carolina		(75)	(469)	(246)	(818)	(1,608)		(103)	(780)	(198)	(1,081)
South Dakota	Black Hills						(37,994)				(37,994)
Tennessee	Cherokee		(382)	(380)	(481)	(1,243)		(1,016)	(196)	(774)	(1,986)
Texas				(2,069)		(2,069)			(2,545)		(2,545)
Utah	Ashley	346				346	4,187	11,995			16,182
	Dixie							3,107			3,107
	Fishlake	612	112			724	159	20			179
	Manti-LaSal		6,741			6,741		3,619			3,619
	Sawtooth										0
	Uinta							55	86		141
	Wasatch	5,267				5,267	7,938	98			8,036
	TOTAL	(6,225)	(6,853)			(13,078)	(12,284)	(18,894)	(86)		(31,264)
Vermont	Green Mtn.	(1,260)	(120)	(200)		(1,580)	(1,030)	(100)	(160)		(1,290)
Virginia	George Washington	19	489	69	479	1,056		2,953	155	65	3,173
	Jefferson		105	760	477	1,342		1,261	730	54	2,045
	TOTAL	(19)	(594)	(829)	(956)	(2,398)		(4,214)	(885)	(119)	(5,218)

TABLE 8 TIMBER STAND IMPROVEMENT NEEDS (Continued)

		RELEASE					THINNING				
	Productivity Class	20-49	50-84	85-119	120+	TOTAL ACRES	20-49	50-84	85-119	120+	TOTAL ACRES
Washington	Colville		389	80	0	469	0	12,296	2,538	0	14,834
	Gifford Pinchot	2,005	11,620	7,457	1,285	22,367	7,887	15,049	24,947	7,078	54,961
	Mt. Baker-Snogualmie			1,384	1,421	2,805	178	1,373	5,363	3,753	10,667
	Okanogan					0	3,039	15,022	499	0	18,560
	Olympic			92	639	731	1,222	12,968	13,738	9,948	37,876
	Wenatchee		50	494	1,781	2,325	4,412	16,367	11,644	2,062	34,485
	Umatilla		0	0	0	0	85	2,899			2,984
	TOTAL	(2,005)	(12,059)	(9,507)	(5,126)	(28,697)	(16,823)	(75,974)	(58,729)	(22,841)	(174,367)
West Virginia	George Washington		96	19		115		205		244	449
	Monogahela	1,118				1,118		26,015			26,015
	TOTAL	(1,118)	(96)	(19)		(1,233)		(26,220)		(244)	(26,464)
Wisconsin	Chequa-megon		2,000	230		2,230			445		445
	Nicolet		4,800	2,667		7,467		1,000	1,000		2,000
	TOTAL		(6,800)	(2,897)		(9,697)		(1,000)	(1,445)		(2,445)
Wyoming	Bighorn	31,285	1,565			32,850	9,612	1,922			11,534
	Black Hills										0
	Bridger-Teton	380	405	400		1,185		6,424	1,000		7,424
	Medicine Bow	961				961	10,812				10,812
	Shoshone	3,250	1,133			4,383	6,636	2,200			8,836
	Targhee							78			78
	Wastach	686				686	902				902
	TOTAL	(36,562)	(3,103)	(400)		(40,065)	(27,962)	(10,624)	(1,000)		(39,586)
GRAND TOTAL		114,822	173,548	134,770	93,906	517,046	362,057	1,145,484	366,868	220,374	2,094,783
COMBINED TOTAL											(2,611,829)

TABLE 9 REFORESTATION PROGRAM (SUMMARY)

	FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	Beyond	Total Acres	Total M$
BACKLOG									
Approp. Acres	105,065	164,384	160,070	141,850	127,217	106,700	438,983	1,244,269	
Approp. M $	21,828	38,227	37,547	35,977	33,117	28,693	155,815		351,204
KV Acres	23,249	21,258	13,278	7,750	4,863	4,276	1,443	76,117	
KV M $	4,879	4,604	3,191	2,112	1,432	1,400	376		17,994
"Other" Acres	----------60,480----------						54,366	114,846	
Total Acres	128,314	185,642	173,348	149,600	132,080	110,976	494,792	1,435,232	
CURRENT									
Approp. Acres	79,692	50,867	40,849	26,132	21,254	15,588	6,219	240,601	
Approp. M $	14,162	12,047	10,770	9,047	8,285	5,864	1,314		61,489
KV Acres	175,063	114,901	45,607	23,938	18,417	11,920	1,561	391,407	
KV M $	35,684	23,907	12,485	6,544	5,696	3,704	499		88,519
"Other" Acres								111,550	
Total Acres								743,558	

TABLE 10 TOTAL TSI PROGRAM (SUMMARY)

	FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	BEYOND	TOTAL ACRES	TOTAL M$
EXISTING									
Approp. Acres	262,641	286,783	288,682	279,850	234,923	257,277	393,463	2,003,619	
Approp. M $	25,059	31,794	35,586	35,815	30,766	35,801	53,666		248,487
KV Acres	149,742	108,107	92,195	81,650	73,310	66,164	37,042	608,210	
KV M $	13,843	10,557	8,324	6,981	6,424	5,797	4,197		56,123
Total Acres								2,611,829	

E. PESTICIDE USE

Pesticides, which include herbicides, insecticides, fungicides, and rodenticides, were used by the Forest Service to manipulate vegetation and control diseases, insects, and animals that cause damage to forest resources. Herbicides were used primarily for controlling unwanted vegetation in timber management activities.

Public concern over pesticide use (particularly herbicides) became more expressive during 1978. The Forest Service responded to this concern by assisting USDA and EPA in sponsoring a National Symposium on the Use of Herbicides in Forestry and by revising its pesticide-use policy to reflect this increased public concern for the safe use of pesticides on National Forest lands. In addition, the Forest Service cooperated fully with other USDA agencies and EPA in providing use, exposure, and benefit data on pesticides subjected to the Rebuttable Presumption Against Registration (RPAR) process.

No significant known adverse environmental effects occurred on National Forest System lands from the use of pesticides when they were properly used. The USDA Forest Service cooperates with the Environmental Protection Agency (EPA) to evaluate the safety of chemicals for use on forest and rangelands.

1. Herbicides

Herbicides were used in timber management for site preparation, stand release, and precommercial thinning because present day knowledge indicates they are determined to be the most efficient, economical, and environmentally safe method. Use of herbicides in conjunction with controlled burning during site preparation work reduces competing vegetation without extensive soil disturbance and potential erosion problems, which often results when mechanical methods are used. Seedlings can usually be released in one season by using herbicides, whereas satisfactory control by other known methods frequently requires several treatments. Precommercial thinning of timber stands can be accomplished with herbicides when properly applied, which results in enhanced growth of the remaining trees. Herbicides were used in the forest tree nurseries to control weeds, resulting in larger, more vigorous seedlings. Large, dense stands of sagebrush were broken up using herbicides, resulting in improved wildlife habitat and increased forage. Also, noxious weeds--which may be toxic to range animals and may interfere with agricultural production on adjacent private lands--were effectively controlled with herbicides.

Herbicides were used to maintain many miles of fuelbreaks. Fuelbreaks protect all resources of the National Forest System by providing access for wildfire suppression and by creating a discontinuity in the fuel source, aiding fireline establishment. Herbicides were also used on rights-of-way to improve vision and reduce fire hazards.

2. Insecticides

Insecticides in conjunction with cultural practices which reduce stand susceptibility, behavorial chemicals and other strategies were often used to control defoliating insects, bark beetles, and other insects that damage forests and rangelands, thereby preventing death or unacceptable growth loss in commercial timber stands and damage to rangelands. Controlling insect pests resulted in the protection of timber, forage, recreation areas, wildlife habitat, and esthetic values of wild lands.

Human health was protected by using insecticides to control the host and vectors of bubonic plague, thereby allowing the use of recreational areas that would otherwise be unusable because of the high risk of contracting the disease.

3. Rodenticides and Repellents

Rodenticides and repellents were used to manipulate or reduce animal populations that may damage the forest. Without the use of rodenticides, bait repellents and big game repellents, significant quantities of seedlings and young trees would have been malformed, killed, or would have suffered growth loss from animal damage.

4. Fungicides

Fungicides also played an important role in protecting seedlings from damage or death. Protection in the early stages of reforestation is necessary because of the relatively greater susceptibility of the tree at this time, and because of the tremendous investments made in seed production, nursery operations, and site preparation.

TABLE 11

PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
HERBICIDES			
AMITROLE	Noxious weeds	348	730
	Right-of-way	38	250
	Conifer release	1,260	2,185
	Fire protection	3	55
	Gen'l weed ctrl.	163	88
AMMONIUM SULFAMATE	Brush control	171	3,810
	Hardwood control	20	140
	Woody plant ctrl.	108	990
	Gen'l weed ctrl.	31	32
	Fuelbreak	75	237
ATRATOL 8P	Fire protection	3	532
ATRAZINE	Site preparation	5	20
	Release	595	887
	Right-of-way	78	320
	Noxious weeds	818	657
	Grass control	1,824	7,206
	Nursery weeds	20	40
	Gen'l weed ctrl.	127	266
AZULAM	Chaparral grasses	5	13
BALAN	Grass control	6	9
BIFENOX	Nursery weeds	50	150
BROMACIL	Right-of-way	10	200
	Fire protection	1	13
CACODYLIC ACID	Release	469	1,096
	Thinning	89	60
	Site preparation	10	32
	Right-of-way	11	22

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* All units shown in acres unless otherwise noted as follows:
S=Seedlings St=Stumps Sd=Seed P=Posts Mi=Miles
Tr=Trees H=Head of Livestock RS=Rubbing Stations

TABLE 11 (contd)
PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
DALAPON	Site preparation	166	1,373
	Grass control	348	1,307
	Release	262	138
	Cattails	1	10
	Gen'l weed ctrl.	169	140
DCPA	Nursery weeds	216	3,049
	Pre-emergence	160	1,680
	Grass control	5	45
DICAMBA	Noxious weeds	510	881
	Pasture renovation	30	5
DICHLOBENIL	Gen'l weed ctrl.	8	378
DIMID	Pre-emergence	10	67
DINOSEB	Fire control	20	15
DIPHENAMID	Noxious weeds	321	2,008
	Nursery weeds	49	408
	Chaparral grasses	30	160
DIQUAT	Gen'l weed ctrl.	5	30
DIURON	Noxious weeds	68	278
	Right-of-way	54	264
	Gen'l weed ctrl.	28	84
ENDOTHALL	Aquatic weeds	10	90
ERADICANE	Gen'l weed ctrl.	4	13
FLUOMETURON	Gen'l weed ctrl.	8	96
GLYPHOSATE	Noxious weeds	710	758
	Nursery weeds	2	3
	Release	257	258

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TABLE 11 (contd)

PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
GLYPHOSATE (Cont'd)	Right-of-way	20	200
	Gen'l weed and grass control	75	164
KRENITE	Site preparation	310	960
	Right-of-way	94	699
LINURON	Gen'l weed ctrl.	39	39
MALEIC HYDRAZIDE	Right-of-way	10	80
MCPA	Noxious weeds	290	1,868
MINERAL SPIRITS	Nursery weeds	15	2,997
MONOBORCHLORATE	Gen'l weed ctrl.	2	89
MSMA	Thinning	833	1,092
	Right-of-way	20	208
	Nursery grass	24	84
	Conifers	2,924	3,261
NITROFEN	Nursery weeds	45	300
	Noxious weeds	3	46
PARAQUAT	Herbaceous plants	3	2
	Noxious weeds	5	3
PICLORAM	Noxious weeds	3,663	13,627
	Site preparation	2,619	11,263
	Chaparral conifers	518	1,190
	Release	1,020	4,106
	Woody vegetation control	3,517	21,292
	Right-of-way	171	685
	Range improvement	627	105

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TABLE 11 (contd)

PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
PICLORAM (Cont'd)	Hardwood stands	77	7
PICLORAM + DISODIUM TETRABORATE	Noxious weeds	1,275	630
PROMETON	Noxious weeds	1	2
	Gen'l weed ctrl.	1	10
	Right-of-way	1	25
PROPAZINE	Gen'l weed ctrl.	14	28
SILVEX	Noxious weeds	80	60
	Woody plant control	20	5
	Orchard hardwood sprouts	120	300
SIMAZINE	Grass & herbaceous plant control	18	68
	Gen'l weed ctrl.	249	397
	Seed orchard grass control	900 Tr	2
	Right-of-way	28	259
	Noxious weeds	277	904
STODDARD SOLVENT	Nursery weeds	26	300 gallon + 2,310
TEBUTHIURON	Noxious weeds	230	345
TRIFLURALIN	Gen'l weed ctrl.	5	5
VELPAR	Release	175	350
	Nursery weeds	50	45
2,4-D	Noxious weeds	18,771	41,789
	Thinning	71	143
	Release	5,968	11,347

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TABLE 11 (contd)

PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
2,4-D (Cont'd)	Right-of-way	1,918	5,463
	Brush/Ski Slope Clearance	100	108
	Fish habitat improvement	6	100
	Hardwood control	100 Tr.	2
	Fuelbreak maintenance	1,505	3,990
	Site preparation	1,198	3,483
	Aquatic weed control	80	1,220
	Gen'l weed ctrl.	500 Tr +194	228
	Range improvement	1,865	5,515
	Flood control	35	280
2,4-D amine	Noxious weeds	56	106
	Release	5,398	9,625
	Thinning	1,195	3,131
	Site preparation	13,585	33,956
	Hardwood maintenance	8,496	21,310
	Gen'l weed ctrl.	22	90
2,4-D + 2,4-DP	Right-of-way	3,957	3,547
2,4-D ester	Woody plant control	49	175
	Release	5,669	17,007
	Gen'l weed ctrl.	5	17
2,4-DP	Chaparral grasses	7,313	10,093
2,4-D ester + 2,4-DP	Site preparation	2,651	8,521
2,4-D + PICLORAM	Noxious weeds	777	1,122
	Hardwood maintenance	837	862

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TABLE 11 (contd)

PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
2,4-D + PICLORAM (Cont'd)	Release	5,193	11,629
	Right-of-way	295	1,060
	Site preparation	36,931	79,642
	Range rehabilitation	122	131
	Thinning	3,588	4,770
	Wildlife site improvement	195	243
	Powerline maintenance	52	133
2,4-D amine + PICLORAM	Noxious weeds	723	1,258
2,4-D + DICAMBA	Noxious weeds	4,160	7,632
	Hardwood maintenance	457	324
	Release	159	45
	Range weed test	2	5
	Gen'l weed ctrl.	15	90
2,4-D + ATRAZINE	Noxious weeds	40	272
2,4-D + ATRATOL	Vegetation control	48	384
2,4-D + 2,4,5-T	Release	83	174
	Right-of-way	4	20
2,4,5-T	Release	3,299	6,128
	Site preparation	325	84
	Sprout control	1	2
	Trail maintenance	6	21
2,4,5-T ester	Hardwood control	151	184
	Wildlife openings	385	325

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TABLE 11 (contd)

PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
INSECTICIDES			
ACEPHATE	Seed Orchard Insects	39 Tr.	74
BACILLUS THURINGIENSIS	Gypsy moth	104	69
BHC	Bark beetles	100 Tr.	2
CARBARYL	Cottonwood leaf beetle	5 Tr.	1
	Spruce budworm	750	563
	Bark beetles	855 Tr.	211
	Mormon crickets, fleas & aphids	311	311
	Pine sawfly	4,000 Tr.	8
	Cotton Boll Weevil	3	9
	Walnut bud borer	8	8
	Black grass bugs	800	800
CHLORDANE	Cutworms	.3	6
CHLORPYRIFOS	Dark beetles	90 Tr.	6
CIODRIN	Livestock treatment	9,000 H	11
COUMAPHOS	Livestock heel & face flies	10 RS	1
DFTM-NPV	Douglas-fir tussock moth	1,200	4
DIAZINON	Cutworms	34	79
	Roaches, ticks, chiggers	8	2
	Ticks, spiders, ants	1	10

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Tr=Trees H=Head of Livestock RS=Rubbing Stations

TABLE 11 (contd)

PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
INSECTICIDES			
DIAZINON (Cont'd)	Rodent fleas	4	1
DIMETHOATE	Birch leaf miner	5 Tr.	1
DORMANT OIL	Pear psylla	50	800
ETHYLENE DIBROMIDE	Mountain pine beetle	7,729	3,225
FENITROTHION	Dendroctonus terebrans	40 Tr.	2
FURADAN	Seed & Cone insects	254 Tr. + 293	3,186
GUTHION	Seed & Cone insects	21,804 Tr. + 10	2,150
ISOTOX	Nursery	.33	15
LANNATE	Western spruce budworm	750	219
LINDANE	Mountain pine beetle	62	5
	Bark Beetles	6,615 Tr.	109
	Protection of paraquat treated trees	3,000 Tr.	50
LINDANE TOXAPHENE	Livestock heel & face flies	2 RS	1
MALATHION	Nursery Insects	1	3
	Seed Orchard insects	5 Tr.	2
	Grasshoppers	47	64
	Flies, Ants & mosquitos____	20	10

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Tr=Trees H=Head of Livestock RS=Rubbing Stations

TABLE 11 (contd)
PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
MARLATE 50	Livestock insects	169 H	6
MIREX	Fire ants	459	53
NICOTINE SULFATE	Aphids/Mites	5	1
PENTACHLOROPHENOL	Wood rot	150 P	3 gallon
PERMETHRIN	Arthropods	60 Tr.	3
PYRETHRIN	Bloodworm control sewage plants	2 plants	15
RUELENE	Livestock treatment	4,000 H	250
SEVIMOL	Mountain pine beetle	11,606 Tr.	2,821
TETRACHLORVINPHOS	Flying insects	20	26
TRICHLORFON	Range caterpillar	53,000	13,250
VAPONITE 2	Ticks, spiders, & ants	1	5
FUNGICIDES			
BENLATE	Anthracnose	4	4
	Seed Bed Sterilization	18	91
	Fusarium	50	720
BENOMYL	Soil fungi	35	350
	Nursery weeds	15	170
	Root rot	458,000 S	20
BORAX	Fungus	635 St + 251	978

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TABLE 11 (contd)

PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
CAPTAN	Nursery soil & root fungi	45	250
	Damping off	.08	35
	Hardwood foliage diseases	2	1
CHLOROPICRIN	Nursery Nematodes	10	2,940
CHLOROPICRIN + METHYL BROMIDE	Nursery fungus	94	33,684
	Soil fungi	34	12,743
	Root rot	45	15,750
CHLOROTHALONIL	Nursery foliage diseases	55	217
CARBONATE	Fungus	.01	1
DACONIL	Nursery Brownspot	5	30
DAZOMET	Pests in nursery	10	3,800
	Fungus	5,100 S	5
ETHYLENE DIBROMIDE	Soil fungi	12	4,000
FERBAM	Fusiform rust	40	1,368
MANEB	Lophodermium needle cast	36	115
METHYL BROMIDE	Gen'l weed ctrl.	15	170
	Soil pathogens	.3	80
	Nursery weed control	.3 + 20 yd. soil	124
	Town ants	3	6
	Soil fumigant	soil plots	78

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* All units shown in acres unless otherwise noted as follows:
S=Seedlings St=Stumps Sd=Seed P=Posts Mi=Miles
Tr=Trees H=Head of Livestock RS=Rubbing Stations

TABLE 11 (contd)

PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
THIRAM	Damping off	200 # Sd	84
VAPAM	Soil fumigant	.09	27
VORLEX	Nursery Nematodes	31	7,920
ALGACIDES			
AQUAZINE	Algae	8 greenhouses + 4	67
PISCICIDES			
ANTIMYCIN-A	Small fish	22	1
ROTENONE	Trash fish	3 ponds + 152	317
PREDICIDES			
SODIUM CYANIDE	Coyote control	127,440	5.61 grams
REPELLENTS			
BGR	Deer/Reduce seedling damage	3,813	2,114
THIRAM	Mice/deer/rabbit repellent	2,980 Tr	32
	Nursery repellent	21,124 # Sd	1,000
ZIP	Deer/Reduce seedling damage	254	173
RODENTICIDES			
STRYCHNINE	Pocket gophers	13,287	1,471

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* All units shown in acres unless otherwise noted as follows:
S=Seedlings St=Stumps Sd=Seed P=Posts Mi=Miles
Tr=Trees H=Head of Livestock RS=Rubbing Stations

TABLE 11 (contd)
PESTICIDE USE REPORT FOR FY 1978

COMMON NAME	TARGET PEST/ PURPOSE	QUANTITY TREATED/USED	
		UNITS*	POUNDS
RODENTICIDES			
STRYCHNINE (Cont'd)	Seed-eating rodents	1,000	5
	Ground rodents	15,654	52
	Porcupine control	100 sites	2
ZINC PHOSPHIDE	Rodent control	3,608	71

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* All units shown in acres unless otherwise noted as follows:
S=Seedlings St=Stumps Sd=Seed P=Posts Mi=Miles
Tr=Trees H=Head of Livestock RS=Rubbing Stations

IV. APPENDIX

A. FORESTRY RESEARCH

The Forest Service conducts research through eight regional experiment stations, and the Forest Products Laboratory. Field and laboratory research is conducted at 81 locations throughout the United States with outdoor laboratories at 93 experimental forests and ranges. Facilities and activities are also maintained in Puerto Rico and the Pacific Trust Islands, as well as the outlying States of Alaska and Hawaii.

Forest Service research develops technologies needed for public land management activities; constitutes an impartial source of relevant information for dealing with public policy issues in forestry; addresses basic and applied research problems of both short and long term, and provides a broad variety of technical information and guidance for decisions by small private forest landowners, small businessmen, State agencies and commissions, and individual private citizens. In addition, industrial and private research organizations, universities, and other agencies frequently have expertise and facilities that are used for Forest Service research through cooperative agreements. This research capability complements in-house capability, fosters strong cooperation among forest research organizations, and frequently provides a means of achieving new goals without increasing our work force.

1. Major Forestry Research Efforts

Five major areas of renewable resource research describe the scope of Forest Service research:

Renewable resource management research on managing, reproducing, planting, and growing vegetation on forests and rangelands for timber, forage, water, fish and wildlife, esthetics, recreation, and wilderness, and on alternative management systems for forests and rangelands.

Renewable resource environmental research on understanding and managing surface and subsurface waterflow, controlling erosion, restoring disturbed soils, improving wildlife and fish habitat, reducing air and water pollution, providing amenities, and understanding and predicting weather.

Renewable resource protection research includes protecting vegetation and other forest and rangeland resources from fires, insects, diseases, noxious plants, and pollutants; and protecting people, natural resources, and property from fires in rural areas.

Renewable resource utilization research on harvesting, transporting, and utilizing wood and other materials from forests and rangeland resources; recycling and fully utilizing wood fiber; and testing forest products.

Renewable resource assessment research including developing and applying knowledge in support of the survey and analysis of forest and rangeland resources; and keeping a comprehensive survey and analysis of present and future renewable resources.

Forest Service research also supports international forestry and environmental efforts. With new legislation in the form of the "Forest and Rangeland Renewable Resources Research Act of 1978" and Section 1458 of the "National Agricultural Research, Extension and Teaching Policy Act of 1977", commonly cited as the Food and Agriculture Act of 1977, the Forest Service is prepared to take a more active role in providing international policy and program advice and assistance to other U. S. agencies, to the U. N. agencies, and to foreign countries.

2. Major Findings and Applications

a. Renewable Resource Management Research

Research contributes to land-use plan. -- Based primarily on the strength of research results, timber harvesting will resume on the slopes of the South Fork of the Salmon River. A long-term research program in the Idaho "Batholith" (an area characterized by steep slopes and highly erodible soils) contributed directly to a Boise National Forest landuse plan. The plan calls for an average annual timber cut of nearly 8 million board feet for 5 years, followed by an increase to about 12 million board feet per year. The timber cut will depend on continued favorable fishery conditions in the river.

The South Fork of the Salmon, a key spawning stream for anadromous fish, is typical of the Idaho Batholith. Intensive logging and road construction followed by severe storms (in 1964 and 1965) caused extreme sediment deposition that filled resting pools and buried many fish spawning beds. As a result, the Forest Service declared a moratorium on all timber sales and road construction in the South Fork.

The Intermountain Station then accelerated research to help improve conditions in the South Fork and to provide for better management of all Idaho Batholith land. Studies over a 15-year period determined erosion and sediment impacts of logging and road construction and developed erosion control practices. Guided by these results, scientists worked closely with National Forest personnel to develop a land-use plan for the South Fork. The research used in developing the South Fork plan is also being applied in other National Forests in Idaho.

A new approach to environmental assessment. -- Researchers at the Pacific Southwest Forest Range and Experiment Station have developed a new computer-assisted system that will aid forest and range managers with the difficult task of assessing the impact of various land treatments on the environment. Called IMPACT, the system consists of (1) an information base of cause-and-effect relations commonly associated with management activities; and (2) a computer program that resource managers and specialists can use to search this information base. It combines the speed, memory, and thoroughness of the computer with the professional skills, local knowledge, and judgment of the user in assessing environmental impact in land-use planning.

In its developmental stages, IMPACT was tested on actual land-use problems on the Tahoe National Forest in California and in a six-State area in the Rocky Mountains and the Great Plains. It is currently being used by planning units in both the Forest Service and the Bureau of Land Management throughout the United States.

Test-tube trees for Hawaii. -- Scientists at the Pacific Southwest Station have produced a clone of test-tube trees by propagating koa through "tissue culture." Koa is a valuable timber tree in Hawaii. Unfortunately, straight-stemmed, fast-growing superior trees are becoming rare, and the species is difficult to propagate by cuttings or other conventional methods.

From a single line of callous tissue--capable of cell division and root formation--the scientists produced hundreds of shoots, which continue to proliferate. They worked out a process by which the shoots were made to root and eventually grow in the nursery into healthy young trees.

Nursery-grown trees from the clone have been successfully established in field plantations, where they have attained normal form and growth rate. While tissue or single-cell cloning of other plants is somewhat more common, the techniques have been proved successful with perhaps no more than a half dozen tree species.

Tissue propagation ensures that all the young plants will be genetically identical to the parent tree. Each rooted plantlet continues to produce numerous shoots, which can be separated and grown independently to increase the clone.

Once established, tissue culture will produce young trees much more rapidly, less expensively, and in far less space than what is required for vegetative cuttings from 5- or 6-year old trees.

New nurse tree for walnut. -- Trees frequently need some help in growing. Often, that help comes from minute bacteria living in nodules on the roots of other plants. These bacteria change nitrogen from a gas into a usable form that all living things need...including black walnut trees. Researchers from the North Central Station have found that they can use plants that harbor nitrogen-fixing bacteria, such as autumn-olive, to boost the growth of black walnut trees. On poor sites, young walnut trees may stagnate--stop growing--from lack of nitrogen before they are 10 years old. By planting walnut in mixture with autumn-olive, scientists have overcome this stagnation without resorting to fertilization. In plantations in Missouri, Indiana, and Illinois, walnut grown in mixture with this "nurse" tree averaged 82 percent taller than those in pure stands.

Models now predict forest development. -- Timber harvesting is scheduled and management dollars are allocated according to predictions of how well forest trees will respond to management practices. Forest managers now have a valuable tool-sophisticated computer models-to accurately predict growth and yield of mixed forest stands. The rate of regeneration, after such practices as planting, site preparation, or partial cutting, can be forecast through use of the models. Thus, the manager can select a combination of cutting practices or regeneration methods that will be best for each location. Potential problem areas can be identified,

and research and management efforts can be directed to increasing the productivity of such sites.

The models, developed by the Intermountain Station, are now being used by managers of public and some industrial land. Most of the National Forests in northern Idaho and Montana are incorporating the methods in their forest inventory and land management planning activities.

Site evaluation for southern hardwoods made easy. -- Soil scientists at the Southern Station have devised an accurate method for determining suitability of sites for eight of the most important hardwood species planted in the South. The method, recently published as a field guide, enables forest managers to assign numerical site index ratings to any soil or site in the southern hardwood region, except in mountainous areas. One of the best features of the new technique is that it is easy to use; it doesn't even require knowing the soil series. And, it provides guidelines for improving the soil. For cottonwood, the leading plantation hardwood species in the South, the method can be used to estimate volume production at various ages.

The approach is based on the fact that each of four major soil factors (physical condition, moisture, nutrient availability, and aeration) accounts for a certain proportion of tree growth. By examining each property of a soil and deciding whether it is good, adequate, or bad for a particular species, one arrives at a site quality rating.

Field testing has only recently been completed, but the method is already widely used across the South. Forestry interests have requested expansion to include additional species, and work has begun to add five more important hardwoods.

Wildlife and timber: peaceful coexistence. -- Forests managed for timber can also sustain much wildlife, but only if the animals are favored by timber management prescriptions. Special management considerations include:

Trees grown in open stands have well developed crowns and produce more fruit than trees grown in dense stands.

Understory plants growing in light to moderate shade begin fruiting younger and produce fruit more consistently than plants in deep shade.

Tree age affects productivity; trees in the middle of their life span produce more fruit than either young or old trees.

Prescribed burning increases fruit production of many understory species but may destroy other species or seriously reduce their capacity to produce fruit.

Genetically superior trees may grow 20 to 30 percent faster than unimproved trees, and it is likely that fruit production can be increased correspondingly.

The variety of fruits is as important to wildlife as is the abundance. When many kinds of plants are present, fruits are likely to be available year-round, stands will produce fruits consistently year after year, and the habitat will meet the needs of many wildlife species. A variety of fruit also offers animals a balanced diet, especially in the South, where many forages are deficient in nutrients during several months of the year.

Intensive management pays off for California deer herd. -- Like deer throughout California, the North Kings herd of the central Sierra Nevada has steadily declined in recent years -down from an estimated 17,000 in 1954 to a low of about 3,500. However, as a result of an intensive cooperative research and management program, a concept of total management is being developed and implemented for this herd in an effort to restore its numbers.

Under the integrated program, co-sponsored by the Pacific Southwest Station and a diverse group including a sportsmen club and State and Federal agencies, the type and proportion of needed forage have been determined, new forage species have been introduced, and fertilization trials have improved quantity and nutrition of herbaceous vegetation. More than 10,000 acres of deer range have been treated in 30 different management projects, ranging from seeding to prescribed burning. Some of the treatments so enhanced vegetation that deer use increased five-fold. In one prescribed burning treatment, mountain whitethorn, a favored browse species, increased from 28 to 560 plants per acre, and the range is continuing to improve.

The techniques for improving habitat have been coordinated with timber harvesting, watershed management, and fire management to expand the herd. So far, the coordinated management techniques have resulted in improved habitat, increased browse with higher nutritional values at critical stages, total increase in the herd, improved age distribution, and increased fawn survival.

Private land for public recreation. -- What part does--and could--private land play in providing space and facilities for public recreation? The question is important in view of the increasing demand for recreational sites and the large amount of privately owned forest and range land. The Southeastern Station conducted a nationwide survey of forest and range landowners to determine the amount of private land that is open to public recreation and the attitudes of landowners toward such use. More than half the corporate forest and range land in the United States is open to public recreation, and almost one-third of that owned by individuals and families is similarly open. A major reason given by corporations for allowing public use is to improve public relations.

Many noncorporate owners cited difficulties in posting their land. Many of those who allow public recreation encounter problems such as littering, garbage dumping, fire, vandalism, crop damage, equipment theft, illegal hunting or fishing, and intrusions on owner privacy.

More than half the owners of closed land said that they would not allow public recreation under any circumstances. However, others said that reasonable profit, protection from lawsuits, and tax incentives would induce them to change their minds.

The survey concludes that a large amount of private land is available for public recreation. East of the Mississippi River, this acreage far exceeds that of public land.

b. Renewable Resources Environmental Research

Water quality in the Northern Rocky Mountains. -- What happens to water in the mountains affects its use on the plains. So the place to begin protecting our water supply is at its source. Congress recognized this in 1972 when it amended the Federal Water Pollution Control Act to require that pollution control "...be planned and managed through an integrated, area-wide wastewater treatment plan." This direction posed a problem in the northern Rocky Mountains, where little is known about basic water quality relations.

To help meet the mandate, the Intermountain Station and the Environmental Protection Agency began to investigate the quality relations of water that originates in the forests of the northern Rockies. Researchers established study areas in river basins near Glacier, Yellowstone, and Grand Teton National Parks. Streamflow, suspended sediment, and dissolved elements were analyzed and correlated with watershed geology and other physiographic characteristics.

The researchers developed water quality rating curves and other predictive relations between basic geology and water quality. The Environmental Protection Agency and local planners now use this information in their planning process.

The information was also used to develop a model--the Water Quality Benchmark System--now being adopted by the Northern Region of the Forest Service. The system shows high potential for helping integrate water quality considerations into land management planning.

How much pollution is "normal" for forest water? -- To establish water quality standards for forest land, we need to know how much water pollution is "normal", otherwise standards might be so strict that conducting forestry operations would be impossible.

Southern Station scientists have examined water from undisturbed pine-forested watersheds, for example, and found that the level of phosphorous in solution is near that suggested by the EPA as the maximum allowable. Phosphorous in suspended sediment accounted for two-thirds of the total annual phosphorous yield. This finding emphasizes the importance of minimizing sediment yield to protect water quality.

So far, scientists have determined that sediment concentrations average about 0.007 tons per acre-inch of flow from planted loblolly pine and mature natural shortleaf pine-hardwood stands in the upper Coastal Plain of Mississippi. Concentrations from individual storms may be 10 times or more higher, due largely to flushing of sediment accumulated in channels--a phenomenon that may be unrelated to forestry operations. Recently, the Southern Station, universities, and forest industry began a project to find base levels of pollution for other geographic areas of the Coastal Plain.

Sanitation in the back country. -- Disposal of human waste is one of the most critical problems for back country managers. The problem is compounded because many campsites are located at high elevations where the soil is shallow and because use has increased so much that 10 to 20 visitors per night may use the same facilities.

Frequent relocation of latrines is a short-term solution at best. A standard latrine requires a hole at least four feet deep and hence the number of possible sites is limited.

Researchers at the Northeastern Station have done much to solve this problem by using waste composting methods. A simple bin was developed to compost human wastes mixed with ground bark. The decomposition process takes about two weeks in the closed container and the compost pile reaches temperatures above 60 degrees Centigrade. The bin can be maintained easily by regular field crews and the end product is a humus-like substance, environmentally safe and odor-free. Because the process is contained in the bin, soil depth is no longer a problem. Cost of a unit is about $100. One such bin can process the waste of more than 1,500 people per year at a total cost of about $250.

Turning waste into wood. -- Scientists from the North Central Station are learning how to use a tree instead of a treatment in disposing of municipal sewage. They are letting Michigan's forests recycle city wastes into fiber and foliage.

In northern Lower Michigan near Cadillac, researchers are spraying forest land with environmentally safe dosages of sewage sludge that fertilize trees without releasing too many nutrients to the ground water supply. The study has found that cost to the city is no greater than with conventional treatment methods.

In studies near Harbor Springs and near Middleville, Michigan, researchers are examining two questions: Can the trees grow with large amounts of effluent? Can they remove the nitrogen, phosphorus, and other nutrients from the sewage? Preliminary results look promising for other communities that choose land disposal systems over treatment plants. As the treated trees grow on these forest and cut-over lands, researchers will evaluate the long-run effects of sewage effluent and sludge on water quality, timber production, and energy use.

Ask "RUN WILD" for information about wildlife needs. -- How does harvesting forest trees, building a dam, or establishing a recreation area affect wildlife? Research has developed many bits and pieces of valuable information about individual species, but frequently managers have difficulty assembling these fragments to solve specific problems. To help managers collect such information, Rocky Mountain Station wildlife researchers designed a computerized information storage and retrieval system. Called "RUN WILD", the system contains information on wildlife species distribution, protection status, and key food and cover requirements.

The system can provide three types of information. First, RUN WILD provides basic information, such as lists of mammals, birds, fish, reptiles, or amphibians in an area. It can also provide more detailed information about specific food or cover requirements of individual species. Finally, the manager can ask RUN WILD for specific management information and literature references for particular species likely to be affected by his actions.

Current documentation for the Southwest consists of over 3,000 references on 324 birds, 159 mammals, 105 fish, 105 reptiles, and 27 amphibians. The system is now being readied for adoption in other parts of the country.

Predicting and preventing landslides. -- A 5-year research program has revealed much about the cause and prevention of landslides in the Pacific Northwest. Scientists from the Pacific Northwest, Pacific Southwest, and Intermountain Stations have made progress in defining the mechanics of land failure and quantifying the contributing factors, and have begun to develop practical methods to identify potential problem areas. Preliminary findings indicate that soil is strengthened by the inter-twining and anchoring of root structures. The effect of timber harvest practices on development of landslides has been defined and is being quantified for specific areas. In addition, researchers now know how much rainfall will cause soil to move on slopes, the effect of bedrock types and structure on the generation of landslides, and the type of failure caused by major storms.

The program is now moving into a second stage with emphasis on applying research results in managed forests. A 5-year program has begun in southeast Alaska to (a) develop techniques for predicting landslide hazard resulting from forest management activities, (b) identify moisture conditions and storm characteristics that could trigger landslides under different geomorphic and geologic conditions, and (c) measure onsite and downstream landslide damage to water quality and anadromous fish habitat.

The techniques developed are expected to be applicable throughout the Pacific Northwest.

Snow control research yields useful by-product. -- Blowing snow often makes winter driving hazardous over most of the northern United States. However, Forest Service scientists from the Rocky Mountain Station's snow control project in Wyoming and Colorado have developed engineering systems to take much of the sting out of blowing snow in critical areas. Scientifically designed and placed snow fences up to 12 feet tall are highly effective for trapping snow in drifts away from highways, improving visibility, and reducing road ice. A $2 million, 21-mile snow fence system designed by the Forest Service for the Wyoming Highway Department has reduced accidents up to 50 percent and highway closure time up to 80 percent along a drift-prone stretch on Interstate Highway 80. A similar system is being constructed to protect Alaska's North Slope oil pipelines.

The Wyoming Highway Department also uses a computerized Forest Service "drift profile prediction model" for earthwork design, so that highways can be engineered to be drift-free.

These applications of snow control research, originally intended for avalanche control and water yield in the high Rockies, will significantly reduce highway snow removal costs, help conserve fuel, prevent deterioration of pavement caused by moisture penetration, and increase highway safety.

Environmental effects of weather modification. -- Weather modification, generally cloud seeding, is being used in California and other western states to increase water supplies. Its widespread use has been hindered, however, because little is known about the environmental effects of increasing or extending the snowpack. Because it is difficult or impossible to measure the effects of weather modification by conventional monitoring methods, scientists at the Pacific Southwest Station analyzed long-term records of precipitation, temperature, and snowpack and developed simulations for various aspects, covers, and climatic regimes. The simulations were used as a basis for evaluating the impact of weather modification.

The analyses and evaluations showed that, although weather modification can increase long-term average precipitation 10 to 15 percent, the increase is not expected to cause significant changes. The work also resulted in a method for scheduling and monitoring early season cloud seeding to prevent development of abnormally large snowpacks in unusually wet years.

c. Renewable Resource Protection Research

Quick action saves money - and elms. -- Researchers at the Northeastern Station have shown that losses of trees to Dutch elm disease can be reduced by early identification and removal of diseased trees. An intensive detection program and quick removal of the diseased trees actually reduces the incidence of disease and lowers cost in the long run. This is good news for municipal arborists in particular, and for city and town dwellers in general.

In a recent trial, disease surveys during the summer months were tripled in parts of the Northeast. The affected trees were removed within 20 working days after detection of the disease, instead of waiting to remove them during the fall and winter months. This intensified effort reduced the incidence of Dutch elm disease by 1.2 percent the first year, 2.4 percent the second year, and 6.7 percent the third year.

Cost of this program was twice that of the conventional survey program, but tree removal cost was only three-fourths that for the usual treatment. The net result over a three-year period was a dollar savings to the taxpayers of about 25 percent. More importantly perhaps, the program saved an additional 92 trees per thousand in the elm population to maintain the beauty of the neighborhoods.

Immigrant pine proves blight resistant. -- Austrian pine has long been used for landscape planting, and in shelterbelts to protect people, crops, soils, and wildlife from the harsh environment of the Great Plains. However, a devastating needle blight, caused by a fungus, kills many trees.

In an effort to discover faster growing, disease resistant strains of Austrian pine, Rocky Mountain Station scientists in eastern Nebraska established plantations in 1962 from seeds collected throughout the natural range of this species in Europe.

Although many sources produced some trees highly resistant to the needle blight, a Yugoslavian source was consistently better than others -- much better than sources traditionally used to grow seedlings for distribution in the United States. As a result, young trees from the Yugoslavian seed source are now being mass-produced in "seed orchards" for wide-spread planting in shelterbelts and urban areas.

Breeding for rust resistance. -- Fusiform rust is the most serious disease in southern forests. It attacks young pines, particularly those in plantations, and the only promising method for controlling the disease is by breeding resistant trees. Recent findings at the Southeastern Station indicate that this breeding will be a continuing task, as it is with grains.

Plant breeders are constantly developing new strains of wheat to keep ahead of wheat rust. They must do so because the fungus is highly variable and develops the ability to infect previously resistant strains. It appears that the same sorts of programs will be required to control fusiform rust in forest plantations.

Many studies have demonstrated that loblolly pines, the most popular trees for reforestation in the South, vary widely in their resistance to fusiform rust infection. Some of the most resistant trees have been cross-pollinated, and their progeny are being included in tree breeding programs. A recent study shows, however, that different strains of the rust fungus vary widely in their ability to infect loblolly pines. Even the most resistant pines are highly susceptible to infection by some forms of the rust.

According to pathologists who did the research, the findings are neither surprising nor depressing. Although breeding for resistance on a one-time basis would have been more desirable, the technology for locating resistant pines and crossing them with trees containing other desirable traits will have to be the weapon used to combat Fusiform rust.

Guide for managing sycamore pests. -- Throughout the South, sycamores are important in natural stands and are often cultured in plantations. They also are widely planted as attractive, fast-growing ornamentals. But insects, diseases and pollutants take a heavy toll of sycamores. Although these pests kill few trees, they reduce growth, mar the beauty of the trees, and degrade lumber.

Researchers at the Southern Station and pest management specialists of the Southeastern Area, State and Private Forestry, have assembled a booklet of the latest information on 31 species of insects and diseases and four air pollutants that commonly damage sycamores. The 36-page, color-illustrated publication includes guides for identifying the pests and the damage they inflict. It gives preventive measures, cultural practices, EPA-registered chemicals, and harvesting techniques that can be used for control. outbreaks of insects.

Protecting seed orchards from insects. -- More and more tree plantations are being established from genetically improved seed produced in seed orchards. Like all "farm" crops, pine seeds have enemies, particularly insects. So, like the farmer, a seed orchard manager must find ways to protect his crop while producing a minimum of environmental side effects. Forest Service entomologists have developed a procedure called cone analysis to help.

A few years ago, production in some southern pine seed orchards was so low that the Southeastern Station was asked to find the cause and develop a cure. Several species of insects were identified as the culprits, and insecticide treatments were developed to control them. But all of the troublesome insects are not present in all seed orchards. To decide whether treatment is necessary, the orchard manager needs to know what insects are attacking and how much damage they are causing. Without this information, he must protect against all insects, including the ones

that are not there.

Systematic analysis of cones and seeds provides the needed information. Details about the procedure are contained in a recent Southeastern Station publication. By following the recommendations, a manager can evaluate his orchard and decide what insecticide treatments are necessary.

Preventing fires where city and wildland meet. -- In Southern California, one of the worst fire hazards occurs where cities and towns encroach on forests, chaparral, and brushland. Wildland fires have increased five-fold in Southern California in the past ten years, and one out of five start where city and wildland meet.

Because of the explosive nature of these fires, preventing them is a lot surer than trying to suppress them once they start. So, the Pacific Southwest Station is coordinating the research for a unique cooperative effort to analyze the fire problem, and to design, evaluate, and implement cooperative prevention programs in such locations. Cooperators include: the National Fire Prevention and Control Administration; and the Bureau of Census, U.S. Department of Commerce; the California State Department of Forestry; the University of California at Riverside; the city and county of San Bernardino; and the San Bernardino National Forest.

Station researchers have developed "spatial risk maps" that pinpoint the mathematical probability that a fire will start in a 110,000-acre study area, extending from the city of San Bernardino through the San Bernardino National Forest to the high desert country to the east. The researchers have also modified Census Bureau computer programs to provide a standardized data base for all important fire and fire prevention information for National Forest, State, county, and city land. This is the first time census information has been used for this purpose.

Better use of fire retardants. -- Air tankers loaded with fire-retardant chemicals are the key to fast, efficient, forest and range fire control. Fire control agencies in the United States use about 29 million gallons of retardants each year in air tanker operations. Retardant costs exceed $5 million a year and their delivery and application add another $20 million to the bill.

Significant savings can be realized by increasing retardant chemical effectiveness, improving methods of delivery and application, and refining strategy and tactics. At the same time, detrimental impacts on the environment resulting from retardant drops must be minimized. Researchers at the Intermountain Station's Northern Forest Fire Laboratory strive to provide fire managers with systems and guidelines to improve the performance of air tanker operations. Consideration is given to the effectiveness, physical properties, delivery systems, and environmental impact of fire retardants. A computer model has been developed that helps assess the fire control value of various retardant characteristics. Field tests measure retardant distribution and concentration at different heights and speeds. An experimental

tank system (designed for the study) tests release of the retardants.

FOCUS fire planning system completed. -- FOCUS, large scale computer simulation system used to develop and evaluate long range fire protection plans, has been completed by research and is in the process of being turned over to its future users. The system already is being used by the Forest Service, Bureau of Land Management and several States. The FOCUS system enables an agency to test a wide range of options such as placement and strength of fire stations, air tanker bases, and location of fire roads. Selection of the optimum fire organization is expected to save millions of dollars in damage and fire fighting costs.

d. Renewable Resource Utilization Research

Increased product yield from southern pine. -- Incomplete use of the resource has traditionally been a problem in forestry. As late as 15 years ago, only about 30 percent of the above--and below-ground portions of southern pine trees harvested for lumber was actually used. Low-grade hardwoods were not used at all. Since then the Southern Station has developed an integrated harvesting and utilization system that has the potential of more than doubling the production of salable wood from each acre of land harvested. Called BRUSH (Biomass Recovery and Utilization with Shaping-Lathe Headrigs), the system could recover two-thirds of the biomass of all tree species as solid wood products.

The system is built around a number of key machines invented or developed by Station scientists. These include: the shaping-lathe headrig for producing flakes and cants from pine and hardwood logs or bolts; the tree-puller to harvest trees with the taproot intact; the mobile-chipper to harvest residues and convert them to chips for fuel and fiber; the continuous tunnel kiln to produce straight, dry pine studs in 10 hours; and the suspension burner for direct firing the kiln using green chips or bark as fuel. The products of this system are crossties, pallets, studs, structural exterior flakeboard that can compete with sheathing grades of plywood, and structural pine lumber in any desired length or width laminated from 1/4-inch veneer.

The system is operational and could be in widespread use in less than 10 years.

Wood products industries can run on wood fuels. -- North Central Station scientists studied the pulp and paper industry in Michigan's Upper Peninsula and in northern Wisconsin to see if use of wood residues could make energy independence possible. They found that nine of 10 major mills within the area could become energy self-sufficient with forest residue fuels in the 1980's.

Although pulp and paper mills have achieved 45 percent energy self-sufficiency by consuming spent liquors and burning some hogged wood and bark, they still purchase huge amounts of energy.

From this research and earlier studies, scientists have concluded that using forest residues as an energy source can have national impact in solving the forest industry's energy needs.

Greater utilization of tropical forests. -- Segregation of tropical species is not necessary for manufacture of a wide range of wood-based products including hardboards, particleboards, and paper. All these products were made successfully at the Forest Products Laboratory from run-of-the woods mixtures of species obtained from three different tropical areas of the world.

The advantages of using mixed tropical species are great. In the source countries, new jobs and higher living standards could result. In this country, because more forest products would be available, the balance of payments might benefit from lower prices.

The research, carried on in cooperation with the Agency for International Development, showed also that the tropical woods require less energy to process than do native species used for hardboard production. And finally, using all species of trees that the land produces permits leaving more of the forest in its natural state.

Current market prices do not warrant establishing a new pulpmill to produce kraft paper from mixed tropical hardwoods at this time. However, economists believe that by 1990 demand in Japan and Western Europe could create a market for imported tropical pulps. Certainly, as populations grow and the resource base shrinks, more complete utilization of tropical forests is almost sure to occur.

Solar power for drying wood. -- Forest Service scientists have designed solar wood dryers at promising savings in cost and energy use. Because drying consumes 60-70 percent of the energy required for manufacturing lumber, using the sun can greatly reduce the need for fossil fuels.

These scientist have built a solar dry kiln, using recycled beverage cans in the solar collector. They found that solar drying takes half the time and produces better quality lumber than does conventional air drying.

These scientists have also developed a lowcost solar kiln for tropical countries such as the Philippines. Their kiln costs less than $6,000 and can dry 4,000 board feet a month. Built into the ground, the kiln's solar collector is separate from the heavily insulated drying chamber. This unique design permits a larger collector for less cost.

Preventing warp in yellow-poplar studs. -- Yellow-poplar, underutilized in recent years, is now showing a surplus of small sawlogs. Although the species is ideally suited for studs because of its strength, small knots, and good nailing qualities, it has one serious fault: when sawed the conventional way, it warps badly.

Researchers at the Forest Products Laboratory have developed a processing system for hardwoods such as yellow-poplar that solves the warping problem. Dubbed the SDR (saw, dry, and rip) Concept, the system utilizes old techniques, but in new ways.

SDR involves sawing logs into wide timbers (flitches), drying the flithces at high temperature (over 212 degrees F), then ripping them into studs. More than 99 percent of the studs so manufactured met requirements for stud grade.

Initial research using yellow-poplar has shown a nearly 90-percent reduction in crook (the most critical warp factor) over conventionally sawn and dried studs. Utilizing yellow-poplar for studs can help to balance supply and demand for this species, reduce the current heavy drain on the softwood crop, and reduce the energy needs for transporting softwoods from the West to the East.

Moving wood chips by pipeline. -- More complete and efficient utilization of forest and mill residues is often hampered and sometimes prohibited by the high cost of transporting wood chips.

To help alleviate this problem, researchers at the Intermountain Station and Montana State University have developed a system for transporting wood chips by hydraulic pipeline. The research took into account design and performance of pumps, injection system, metering and flow-controlling devices, and other components of an operating pipeline. Results show that use of the pipeline system can cut transport costs in half.

The system can move chips from sawmills and plywood mills, where the chips are a byproduct, to a pulpmill or port. Other promising applications include removing chipped wood from chipping operations in remote forest areas where roads are inadequate. In areas where the chips could be transported by pipeline to a lower location, as in most western forest operations, the system operates by gravity flow, eliminating the need for conventional energy sources.

The hydraulic pipeline concept can be applied widely, regardless of distance, terrain, or weather. The concept is also energy efficient; pipeline transportation uses approximately one-eighth the energy required to move the same pulp tonnage by truck.

The hydraulic pipeline has drawn the interest of wood-based industries both in the United States and abroad.

Housing demand projected. -- Housing demand will remain strong throughout the 1980's if economic growth continues, according to a projection model developed by researchers at the Forest Products Laboratory.

After 1990, however, housing demand will moderate because of declining population growth. Demand for single-family housing will continue because of a predominantly middle-aged population. Shifts in population

to the South and West are likely to continue, disproportionately increasing demand in these regions.

The model is proving especially helpful in estimating future timber requirements for the 1980 Resources Planning Act assessment and for use in planning by public and private businesses. The model was used by Oak Ridge National Laboratory to help develop a National residential energy use model.

Projections of housing demand by type of unit and region to the year 2020 were published. These projections have been republished in part by several private groups. They have also formed the basis for estimating rural housing demand to 1985.

Help for land-use planners. -- Local forest and rangeland planning will be a major challenge for public land managers in the years ahead. Congress has directed the major public land management agencies to improve their planning processes, and to provide better opportunities for interested citizens to help resource managers make wise decisions. Rocky Mountain Station researchers in Arizona have improved ways of evaluating and displaying how alternative management decisions will affect yields of renewable resources: timber, water, forage for livestock and wildlife, and recreation opportunities. Visual displays of how resources are affected will make it easier for both interested citizens and land managers to evaluate the complex interactions among resources and the consequences of alternative decisions.

New tools for resource inventories. -- Scientists at the North Central Station have developed a computer system that predicts tree growth in Lake States forests. Using data from sample plots of trees, growth projections over 5, 10, even 100 years can be made for different silvicultural treatments and conditions.

Forest managers can now estimate the volume of timber that would be available under various management strategies. For the next few decades, they can evaluate responses to thinning, harvest cutting, and other cultural treatments.

Researchers are now working to adapt this system to other regions of the country.

Efficient use of integrated resource inventory data. -- An inventory data handling system has been developed to convert large masses of data into simple tables. The system provides an efficient means for both public agencies and private industry to meet changing needs for specific resource statistics. Key features are the system's flexibility to handle any data and its ability to develop information quickly and at relatively low cost. The system has been widely adopted, not only within the U.S.D.A. Forest Service, but also by forest industry, State agencies, and in several foreign countries.

State resource analyses and production figures issued. -- As part of the continuing analysis of the Nation's timber resources and their use, reports on a number of States were completed. The third survey of Kentucky's forest resources showed only a 2-percent increase in total forest area since the previous survey in 1963. However, the net volume of growing stock timber increased by 23 percent to 11.4 billion cubic feet. Of this volume, 92 percent is hardwood species. Despite the large volume increase, the percent of high grade hardwoods has declined to 30 percent of the total volume.

The Mississippi softwood timber inventory increased 30 percent during the period 1967-1976 and hardwoods gained 17 percent. These increases occurred despite a slight decline in forest land area. These trends are expected to continue in the future, although increased industrial activities in the southern and central parts of the State may absorb more of these expanding softwood timber volumes.

Pulpwood production in the 21 Northeastern and North Central States was up 14 percent in 1976 as compared with 1975 to a total of 12.1 million cords. On a State-by-State basis, production rose in 14 States, but fell in Iowa, Massachusetts, Minnesota, New Hampshire, New Jersey, Rhode Island, and West Virginia.

Southern pine acreage may be declining. -- Past harvesting and regeneration practices, plus conversion of forest land to other uses, have led to an average annual loss of 500,000 acres of pine forests in the Southeast. While cropland reversion and conversion of hardwoods stands to pine have offset about half this loss, a continuation of these trends will reduce pine supplies from private, non-industrial ownerships. These findings suggest an opportunity for both Government and industry to provide management assistance and incentives to these owners in order to reverse this trend.

e. International Forestry Activities

Through its International Forestry staff, the Forest Service continues to serve as a source of technical expertise for U. S. agencies and international organizations involved in development efforts overseas. During 1978, nine Forest Service specialists served on resident assignments in seven foreign countries. One and one-half man-years of residency were with the US AID projects in Kenya and Nepal. Another four man-years of resident service were with FAO field projects in Nigeria, Iraq,.Italy, and Iran. Two man-years of overseas residency during 1978 is accounted for by two men presently on assignment in Saudi Arabia under Joint Commission Agreement between that country and the USDA.

During 1978, the Forest Service also provided services of 17 specialists for short-term consultant assignments to eight countries in Africa, Latin America, and Asia. These temporary duty assignments accounted for an additional 1-1/2 man-years of Forest Service participation in development efforts sponsored by US AID, FAO, and USDA.

Our bilateral exchange programs have been active. We sent forest entomology and forest harvesting teams to the Soviet Union during the year, and a six-man delegation to the Federal Republic of Germany in May to review forest recreation and urban forestry programs. A scientist of the Forest Fire and Atmospheric Sciences Research Staff spent two months in Spain, under the US/Spain Friendship Agreement. We are working with the People's Republic of China in exchanging publications and tree seeds and we hope to exchange teams of experts in the near future. We are working with the forestry leadership in Brazil to develop a cooperative program and France has requested that we strengthen forestry ties between our two countries.

In June we participated in a strategy conference on tropical deforestation, hosted by the State Department and the Agency for International Development. As a result of that conference we are now participating in an interdepartmental Task Force to develop and coordinate U.S. Government policy and programs on tropical forests. In addition, Forest Service and AID are co-chairing an interagency working group to draft a U.S. policy, strategy and program document by August 1979.

On the training side of foreign activities, the International Forestry Staff was involved in the preparation of programs and itineraries for 440 visitors from some 58 countries during 1977. This number includes eight AID participants and 23 FAO Fellows, for a total of 31 Project participants representing 11 countries. There were 409 Non-project visitors, representing 47 countries.

B. STATE AND PRIVATE FORESTRY

During the summer of 1978 the President signed into law the Cooperative Forestry Assistance Act. This legislation provides for technical assistance, cost-sharing, and resource protection programs for non-Federal forest lands to be carried out through cooperative management in the State Forestry agencies. This Act consolidates into one comprehensive authority seven laws dating back to 1924 under which State and Private Forestry activities were conducted.

Eight programs are provided for:

1. Rural Forestry Assistance (includes Cooperation in Forest Tree Production (CM-4), Cooperation in Forest Management and Processing (CFM), except Urban and Community Forestry, Assistance to States for Tree Planting: and threatened and endangered species and technical assistance, formerly financed out of General Forestry Assistance (GFA) funds.

2. Forestry Incentives Program (includes all FIP activities).

3. Forest Insect and Disease Management (includes all FIDM activities).

4. Urban Forestry Assistance (includes Cooperation in Forest activities).

5. Rural Fire Prevention and Control (includes Cooperation in Forest Fire Control (CM-2) and Rural Community Fire Protection activities).

6. Management Assistance (includes Organization Management Assistance activities).

7. Planning Assistance (includes Forest Resource Planning and Wild and Scenic Rivers Analysis and Coordination activities) and

8. Technology Implementation (includes technology transfer activities).

The Cooperative Forestry Assistance Act includes a provision allowing funds to be consolidated, so that each State will have more flexibility in targeting its forestry programs to specific needs and priorities.

Implementation will occur gradually over the next several fiscal years to provide for an orderly transition.

1. Area Planning and Development

a. Forest Resource Planning

During FY 1978, $1,138,000 was allotted for Forest Resource Planning. Of this, $392,000 was granted to States on a cost-share basis for the development of State forestry resource plans. There are 40 States now developing State forestry programs and there are 36 planners in these State forestry organizations as a result of this funding. The balance of the funding was used by Forest Service personnel to assist the States in developing model planning processes, to train planners in 34 States, and to assist States in selecting and using planning techniques. Most of these States are in the early phases of developing a State Forestry Resource program, and a few such as Florida, Michigan, and Maryland have made notable progress. Forest Service personnel also provided technical assistance to State foresters in the development of Best Management Practices (BMP's) for Areawide Waste of P.L. 92-500.

b. Resource Conservation and Development

During FY 1978, $746,400 was allotted to States to carry out forestry measures in 59 RC&D Areas. This accelerated forestry program provided for an additional 1,499 forest management plans to individuals and public entities. Several RC&D Areas are stressing forest product utilization and marketing by developing wood as an energy supplement. Other priorities include protection of forested lands from destructive livestock grazing, and contracting minority landowners on the availability of professional forestry services and programs.

c. Small Watershed Program (PL-566)

Major forest land treatment accomplishments on State, private, and National Forest lands during fiscal year 1978 are shown in Table B-1.

d. Flood Prevention Projects

Protection, management, and improvement of forest and related land resources are a vital part of 9 of the 11 projects originally authorized by the Flood Control Act of 1944. Over 7.2 million acres of forest land are involved. Progress in erosion and sediment reducing measures such as tree planting, fire prevention and control, stabilization of gullies, streams, and forest roads, and revegetation of roadbanks received special emphasis. Major accomplishments are shown in the accompanying tables and writeups.

Coosa River Flood Prevention Project, Georgia and Tennessee. -- Technical assistance for installing forestry measures on privately owned land is provided by the Georgia Forestry Commission in cooperation with the USDA Forest Service. In FY 1978, forestry technical assistance was provided to 424 forest landowners. Thirty-eight forest management plans were developed which covered 1,941 acres. Five miles of firebreaks and 21,100 lineal feet of diversion ditches were constructed. Timber stand improvement was accomplished on 236 acres. Proper harvest cutting was performed on 72 acres. Two miles of forest road and roadbank stabilization was done. Tree planting was done on 40 acres. Eighty-three acres of wildlife habitat and 155 acres of outdoor recreation were developed. Two miles of gully control and stabilization was established.

Little Sioux River Flood Prevention Project, Iowa. -- Forestry measures are installed through the Iowa Department of Conservation in cooperation with the USDA Forest Service. During fiscal year 1978, four forest management plans covering 164 acres were completed. Thirty-seven woodland owners were assisted. Proper harvest cutting was applied on 19 acres. Thirty-eight acres of hardwood and conifer plantings were established on 21 separate areas. Woodland grazing control was accomplished on 114 acres. Twenty acres were planted to wildlife habitat. Assistance with insect and disease problems--mostly involving canker-causing fungi, red spider mite, and pine needle scale--was given. Forty community and urban forestry assists were given. Other assists included presentation of windbreak seminars, classroom lectures, woodland training sessions, and involvement with schools and conservation groups.

Los Angeles River Flood Prevention Project, California. -- Project activities by the Forest Service continued on the National Forest lands and on non-Federal lands in cooperating with Los Angeles County and Los Angeles City fire departments.

Helispot construction (2); fire road and trail development (1 mile), fuelbreak construction and improvement (27 miles); and building (2), and water development (2), construction and maintenance, and fire hazard reduction projects comprised the bulk of the fire management program. An air tanker base and a fire station received supplemental financing. The critical area stabilization program encompassed seven erosion control projects along road (7 miles) and in critical erosion areas (290 acres). One channel stabilization structure was constructed cooperatively with the Los Angeles Flood Control District. Some channel stabilization (3 miles) was performed. The construction of this facility will protect the many improvements in this perennially high-debris producing canyon. A Forest Service 1978 Review Report was developed that documents and outlines the inventory of flood prevention needs for the future, covering fire management, cover improvement, primary protection structures, road stabilization and upland channel and slope stabilization projects.

Potomac River Flood Prevention Project, MD, PA, VA, WVA. -- The Forest Service cooperated with the four States and their forestry agencies in the installation of land treatment on State and private forest lands. Additional land treatment was installed by the Forest Service on National Forests in West Virginia.

Accomplishments on State and private forest lands during FY 1978 included 58 miles of access road construction, 3,076 lineal feet of diversion ditches, 27 grade stabilization structures, 108 acres of critical area stabilization, 32.3 miles of forest road and roadbank stabilization, 543 forest management plans involving 23,908 acres, 1 mile of firebreaks built, 4 miles of fire road and trail construction, 2 fire mobile equipment units purchased, 4,392 acres of proper harvest cutting, 2,566 acres of tree planting, 369 acres of timber stand improvement, 233 acres of revegetation of surface mined area, 3,223 acres of forest grazing control, 691 acres of wildlife habitat development, 1,299 acres of outdoor recreation development, 767 acres of intensified fire protection, 200 acres of contour terraces and furrows, and 3,513 forest landowners assisted.

Accomplishments on National Forest land included 1 mile of channel stabilization, 0.8 miles of forest road and roadbank stabilization, 4 forest management plans covering 402 acres, 125 acres of proper harvest cutting, 350 acres of forest stand improvement, and 55 acres of tree planting.

Santa Ynez Flood Prevention Project, California. -- Forest Service activities include protection and improvement of the mountainous western portions of this project.

Accomplishments in FY 1978 include construction continuing on one fire station, site design completed for a proposed heliport, and 3 miles of fuelbreaks constructed. Two 1,500 gallon water tanks were installed and a fire reservoir was constructed. Forty miles of fire road were maintained and maintenance was accomplished on 19 miles of fuelbreaks, a portion of which was done by goat grazing. Intensified fire protection was accomplished on 6,300 acres.

Trinity River Flood Prevention Project, Texas. -- The Forest Service has continued its participation in the planning and installation of structural and land treatment measures on those lands in the project that fall within the National Grasslands.

One hundred and thirty-six acres of critical area stabilization were completed in FY 1978.

Washita River Flood Prevention Project, Oklahoma. -- The Forest Service and Oklahoma Division of Forestry participated in the planning and accomplishment of flood prevention measures for private forest lands in the project area. Additional land treatment was installed by the Forest Service on National Grasslands.

Fiscal Year 1979 activities and accomplishments on private forest lands include 9 acres of critical area stabilization, 27 forest management plans covering 2,086 acres, 28 acres of tree planting, 56 acres of forest stand improvement, 29 acres of wildlife habitat development, 10 acres of outdoor recreation development, and 94 forest landowners assisted.

Accomplishment on the National Grassland include 2 miles of gully control and stabilization, 1.4 acres of contour terraces and furrows, and 1.3 miles of forest road and roadbank stabilization. A complete re-evalutation of the restoration needs and costs of on-the ground work to complete the project was made.

Yazoo and Little Tallahatchie Rivers Projects, Mississippi. -- Forestry measures for both of these projects are provided by the Forest Service. These two projects are conducted concurrently. Work of other agencies and industries have contributed to the overall accomplishments.

In FY 1978, stabilization of 165 acres of critical area was accomplished. Proper harvest cutting was accomplished on 56,616 acres. Two hundred and 54 forest management plans were prepared covering 39,509 acres There were 10,951 acres planted to trees. Other accomplishments included 19 miles of forest road and roadbank stabilization, 6 miles of fire road and trail construction, 2,309 acres of timber stand improvement, 50 acres of revegetation of surface mined areas, 1,929 acres of wildlife habitat development, 668 acres of outdoor recreation development, and 662 miles of gully control and stabilization. About 20,139 forest landowners were assisted during this fiscal year.

TABLE B-1

Works of Improvement Installed in Watershed Protection Projects
(Pilot and PL-566)
(Fiscal Year 1978)

Works of Improvement	Unit	Installed in FY 1978 with Assistance Under the Watershed Protection Program	Est. Practices "On The Land" in Active Projects as of 9/30/78
LAND TREATMENT MEASURES:			
Channel Improvement	Miles	---	6.6
Channel Stabilization	Miles	1	13
Contour Terrace and Furrows	Miles	22.3	916.7
Area Treated	Acres	75	14,409
Gully Control and Stabilization	Miles	5.4	195
Grade Stabilization Structures	No.	5	2,893
Critical Area Stabilization by Tree Planting and Other Measures	Acres	788	42,435.4
Forest Road and Roadbank Stabilization	Miles	68.8	1,827.2
Acres Treated	Acres	40	5,489.6
Fire, Roads, Trails & Firebreaks and Fuelbreaks	Miles	146	1,484
Fire Control Water Developments	No.	2	43
Fire Towers	No.	----	8
Intensified Fire Protection	Acres	32,235	2,300,795
Heliports and Helispots	No.	3	39
Mobile Fire Equipment	No.	----	59
Other Fire Control Improvements	No.	----	458
Radio Installations	No.	1	52
Forest Watershed Management Plans Prepared	No.	1,713	16,236
Area Included	Acres	135,737	1,798,506
Forest Stand Improvement	Acres	3,889	1,082,331
Proper Harvest Cutting	Acres	21,708	489,800
Range and Grass Seeding	Acres	434	47,324
Tree Planting and Seeding	Acres	10,748	261,024
Revegetation, Surface Mined Areas	Acres	75	1,782
Woodland Thinning and Release	Acres	8,831	692,450
Woodland Grazing Control	Acres	1,486	287,335
Recreation Area Development	Acres	1,036	31,139
Wildlife Habitat Development	Acres	2,037	23,993
Wildlife Ponds	No.	8	51

TABLE B-2

Works of Improvement Installed in Flood Prevention Projects
(PL-534)
Fiscal Year 1978

Item	Unit	Installed in 1978 (all funds)	Estimated Total Practices on Land as of 9/30/78
STRUCTURAL MEASURES:			
Access Road Construction	Miles	58	113
Channel Improvement	Miles	----	23.6
Channel Stabilization	Miles	3.1	337.4
Diversion Ditches	Lin.Ft.	24,176	29,477
Floodwater Retarding Structures	No.	----	3
Grade Stabilization Structures	No.	28	1,115
Streambank Stabilization	Miles	----	11.3
LAND TREATMENT MEASURES:			
Critical Area Stabilization by Tree Planting & Other Measures	Acres	654	330,435.1
Forest Road and Roadbank Stabilization	Miles	57.4	1,778.3
Area Treated	Acres	405	17,729.9
Forest Watershed Management Plans	No.	870	18,170
Area Included	Acres	68,010	1,841,344
Firebreaks and Fuelbreaks	Miles	35	3,297
Fire Roads and Trails	Miles	11	516.6
Fire Hazard Reduction	Acres	----	12,125.3
Fire Water Development	No.	5	181
Fire Towers	No.	----	46
Heliports and Helispots	No.	2	458
Mobile Equipment	No.	2	119
Other Fire Improvements	No.	3	214
Permanent Radio Installations	No.	----	313
Proper Harvest Cutting	Acres	61,224	475,394
Forest Stand Improvement	Acres	350	660,464
Tree Planting and Seeding	Acres	13,678	484,550
Woodland Thinning and Release	Acres	2,970	432,770
Revegetation, Surface Mined Areas	Acres	283	6,992
Woodland Grazing Control	Acres	3,337	183,244
Woodland Owners Assisted	No.	24,207	114,339

2. Cooperative Forestry

Accomplishments by fiscal year, State, and Forest Service region are displayed on Tables B-3, B-4, and B-5 respectively. Improved utilization of trees has been emphasized, from felling and bucking in the woods through the primary manufacturing processes. During 1978, 12,749 assists were provided to loggers and processors to improve the efficiency and product recovery of their operations (Table B-3). The available wood supply was increased by nearly 165 million cubic feet without harvesting additional trees. Emphasis on the use of wood for energy was greatly increased in 1978. Wood can significantly reduce dependence in local areas on imported fossil fuels. Dead and dying trees, wood from silvicultural treatments such as thinnings, urban tree removals and non-commercial forest lands can all contribute fuel for energy needs. The Federal/State participation in use of wood for energy will primarily involve assistance in market development and forest management.

An economic analysis was conducted in representative States to better determine the value of assistance provided to forest landowners through the Cooperative Forest Management program. The average duration, cost and benefits of a service forester's assist were determined. The various accomplishments were converted to volume of timber that would be produced over a 40-year rotation. Benefit/cost ratios were calculated for different assumptions. Examples" in the Southeast, considering only the CFM costs and applyinga 6 1/8 percent discount rate, the benefit/cost ratio is 24:1; considering the CFM costs and a possibility that 40 percent of accomplishments would have occurred without CFM assistance, and applying a 10 percent discount rate, the benefit/cost ratio is 5:1.

Accomplishments for cooperative technical assistance in forest management and processing compare favorably in most categories with those targeted for 1978. (Table 1) Although the number of assists for recreation and range exceeded funded targets, the acreages affected by this assistance did not. Assistance in these two resource categories is included in the broader area of multiple use technical assistance. The reduction in recreation and range acreage accomplishments partially represents landowner preference for another multiple use activity--wildlife habitat improvement assistance.

The 1975 RPA recommended program targets were not accomplished in 1978. The targeted activities were funded at historic program levels that are far below the funding levels proposed in the recommended program. Accomplishments in these activities are expected to remain proportioned to the need for funds. Accomplishments in the newly established U&CF program are considerably higher than those foreseen when the recommended program was developed.

The economic and environmental benefits of the cooperative forest management programs are substantial. Over half the Nation's commercial forest land is in non-industrial private ownership, and our lumber and wood fiber supplies are significantly dependent on these lands. The thrust of the cooperative programs for both rural and urban forestry is to increase and improve management. Proper management not only increases supplies of wood, but also provides such associated forest resource values as esthetics, recreation opportunities, wildlife and fish habitat, improved soil fertility and improved quality of water yields.

Table B-6 reflects FY 1978 seedling production accomplishments by State. The Federal funds made available were greater in 1978 than in 1977, but most of these funds were allocated for capital investment purposes. Subsequent increases in seedling production will mostly occur a year or more later.

a. Urban and Community Forestry

In response to Congressional program initiative, the Urban and Communiuty Forestry program began in 1978. Programs were initiated in 31 states and strengthened in 16; 6,500 urban areas were assisted. The program made possible the employment of 100 new State personnel to assist communities in urban forestry. The program provides technical assistance to urban areas and communities concerning the management, care, and utilization of trees in open spaces, greenbelts, roadside screens, and urban woodlands. Table B-5 indicates the State breakdown of urban and community forestry assistance.

The 1975 Recommended RPA program targets were exceeded in 1978 (see Table 1).

b. Forestry Incentives Program

The Forestry Incentives Program (FIP) is jointly administered by the Forest Service and the Agricultural Stabilization and Conservation Service and is implemented through State forestry organizations and State and County ASCS offices. The program has provided cost share assistance to private forest landowners for tree planting and timber stand improvement practices since its inception in 1974.

During FY 1978, 168,814 acres were planted for timber production purposes, and timber stand improvement was accomplished on 139,691 acres (Table 1). The Federal share of the cost of these accomplishments was $14.5 million, and landowners contributed $4.35 million. The millionth acre was treated under the FIP program in Mississippi in 1978. A detailed yield and financial evaluation of the 1974 FIP program has shown that an additional 100 cubic feet of wood can be expected for each Federal dollar invested.

The commitment to Congress to reduce the FIP carryover balance was met; the carryover balance was $2.1 million. This will be reflected in increased 1979 accomplishments. FIP reforestation accomplishments, especially in the South, increased significantly in 1978.

TABLE B-3

COOPERATIVE FOREST MANAGEMENT AND PROCESSING PROGRAM
- PROGRESS

Summary of Selected Activities -- 1940-1978
(U.S. Forest Service and State Foresters Cooperating)

Summary	Progress			
	Woodland Owners Assisted	Area of Woodland Involved	Timber Sale Assistance-- Volume Marked	Loggers and Processors Assisted
Fiscal Year	-Number-	-Acres-	-M bd. ft.-	-Number-
1940	--	--	--	--
1941	165	49,416	2,667	--
1942	224	92,442	10,076	--
1943	3,242	359,388	75,600	--
1944	8,842	742,697	323,557	--
1945	8,093	831,347	411,330	--
1946	12,083	1,321,746	452,367	--
1947	13,531	1,576,888	502,312	--
1948	14,220	1,399,971	503,641	--
1949	17,140	1,769,240	437,903	--
1950	22,828	2,542,564	518,566	--
1951	25,352	2,558,091	721,938	6,451
1952	27,933	2,501,317	609,562	9,429
1953	32,474	2,827,709	527,419	9,579
1954	32,224	2,557,993	538,391	8,429
1955	34,828	2,914,026	549,373	8,182
1956	38,121	3,124,744	625,592	9,254
1957	44,494	3,086,143	538,958	7,933
1958	58,752	3,435,719	444,797	8,926
1959	76,546	4,146,146	659,850	10,846
1960	82,188	4,115,612	569,178	8,099
1961	89,254	4,612,957	459,325	8,325
1962	91,418	4,797,106	547,787	8,126
1963	101,823	5,762,008	588,046	9,146
1964	97,063	6,140,678	668,274	8,691
1965	99,074	6,164,998	716,950	9,248
1966	105,014	6,552,831	906,009	9,825
1967	107,654	6,232,122	785,907	12,545
1968	106,328	7,774,941	704,241	11,097
1969	109,835	7,884,127	855,336	13,347
1970	115,197	6,945,456	1,225,520	13,620
1971	127,828	7,936,595	860,950	14,627
1972	274,001	11,158,328	955,627	5,290
1973	106,422	6,471,894	1,578,664	4,855
1974	117,990	7,105,606	907,311	5,353
1975	140,940	10,368,738	677,532	5,405
1976	105,184	4,085,126	596,599	15,318
1976-77 (T.Q.)	25,253	1,009,677	220,649	5,849
1977	133,619	4,613,667	921,171	29,101
1978	165,329	5,750,049	1,120,743	12,749

TABLE B-4

COOPERATIVE FOREST MANAGEMENT AND PROCESSING PROGRAM
- PROGRESS

Fiscal Year 1979
(U.S. Forest Service and State Foresters Cooperating)

State/ Commonwealth/ Territory	Progress: Assists to Woodland Owners	Area of Woodland Involved	Area Receiving Planting and TSI Assistance 1/	Timber Sale Assistance-- Vol. Marked	Assists to Loggers and Processors	Improved Utilization
	-Number-	-Acres-	-Acres-	-M bd. ft.-	-Number-	-M cu. ft.-
Alabama	2,418	249,979	31,547	458	83	5,107
Alaska	37	236	146	200	30	400
Arizona	342	3,355	1,251	956	28	637
Arkansas	2,461	112,233	28,775	2,512	267	2,244
California	6,294	69,793	19,026	6,815	441	1,921
Colorado	9,951	75,917	2,558	8,219	310	4,561
Connecticut	1,689	20,550	3,028	1,220	71	251
Delaware	1,068	13,339	3,150	7,000	3	79
Florida	2,520	197,071	18,156	4,673	968	3,747
Georgia	14,001	422,695	31,366	15,734	907	27,239
Guam	17	136	128	0	0	0
Hawaii	765	21,419	4,709	2,032	123	400
Idaho	311	10,394	406	2,624	200	3,949
Illinois	1,986	35,158	5,315	8,602	72	0
Indiana	3,667	124,455	12,420	11,878	559	2,403
Iowa	3,023	17,966	3,070	2,758	83	341
Kansas	818	13,209	1,623	1,642	80	51
Kentucky	4,237	106,731	14,642	11,029	157	1,179
Louisiana	2,133	132,742	14,516	9,812	13	1,736
Maine	3,333	62,244	5,662	15,358	1,305	3,574
Maryland	2,434	28,878	5,011	7,467	326	3,482
Massachusetts	3,842	157,752	6,915	28,861	2	100
Michigan	3,087	97,016	10,698	9,380	50	979
Minnesota	4,182	104,058	16,587	12,727	603	2,559
Mississippi	6,374	311,317	57,797	14,518	187	11,947
Missouri	4,976	153,576	17,663	27,445	892	6,147
Montana	1,225	150,737	1,837	94,056	359	9,941
Nebraska	2,047	12,038	3,935	990	39	36
Nevada	267	15,748	919	0	14	333
New Hampshire	3,424	57,477	7,793	5,352	854	5,449
New Jersey	1,559	40,035	1,953	2,844	876	1,944
New Mexico	641	130,138	1,080	802	21	2,392
New York	4,203	203,959	12,251	34,346	454	2,001
North Carolina	8,410	397,173	28,795	79,138	69	872
North Dakota	393	22,748	203	50	2	1
Ohio	3,414	95,924	10,015	23,599	18	2,073
Oklahoma	439	32,846	8,787	721	12	1
Oregon	3,376	170,503	23,498	0	33	8,280
Pennsylvania	1,532	26,388	5,495	4,842	111	1,767
Puerto Rico	598	2,665	711	0	25	2
Rhode Island	189	11,088	876	507	0	0
South Carolina	9,528	290,827	29,088	33,245	108	1,547
South Dakota	1,580	9,317	1,057	4,812	0	0
Tennessee	3,417	83,371	5,004	27,602	45	675
Texas	1,842	150,018	25,653	9,506	14	3,749
Utah	334	21,180	70	891	16	369
Vermont	5,840	210,083	10,304	33,800	578	15,126
Virginia	14,302	716,261	66,201	392,076	639	4,120
Virgin Islands	38	35	21	0	26	2
Washington	2,191	87,156	10,449	0	374	10,488
West Virginia	2,001	65,897	7,455	10,279	61	2,002
Wisconsin	6,219	194,584	20,093	146,652	182	628
Wyoming	154	9,633	438	713	59	5,581
U.S. Total	165,329	5,750,049	600,247	1,120,743	12,749	154,412

1/ Includes both areas receiving technical assistance only and technical assistance as a part of cost-sharing through FIP and ACP.

TABLE B-5

FY 1978 RPSU
COOPERATIVE FOREST MANAGEMENT AND PROTECTION PROGRAM

Fiscal Year 1978
(U.S. Forest Service and State Foresters Cooperating)

Assistance Activity	Unit of Measure	U.S. Forest Service Region or Area									
		Region 1	Region 2	Region 3	Region 4	Region 5 1/	Region 6	Region 10	Northeastern Area	Southeastern Area 2/	Total
Assists Given Forest Landowners, Loggers, Processors:	Number	2,490	15,038	1,032	631	7,640	5,774	67	68,969	76,239	178,078
Forest Management Plans Prepared:											
New --	Number	239	857	45	84	251	1,218	9	15,339	15,165	36,202
	Acres	37,228	54,664	6,052	20,932	31,198	164,335	80	888,930	1,457,184	2,662,253
Revised --	Number	82	53	16	10	69	635	0	1,919	5,940	8,724
	Acres	21,008	831	102,659	3,806	4,273	26,351	0	103,613	357,432	619,973
Site Preparation	Acres	60	2,153	0	11	6,397	9,212	0	14,336	223,021	255,190
Tree Planting:											
For Timber Production --	Acres	243	1,191	268	5	12,938	11,144	141	45,601	226,285	297,816
For Erosion Control --	Acres	29	85	49	60	1,078	44	0	1,518	2,307	5,170
For Surface Mine Reclamation --	Acres	30	60	0	0	35	0	0	728	2,589	3,442
Direct Seeding	Acres	0	5	0	500	703	0	0	3,870	4,681	9,759
Timber Stand Improvement	Acres	1,390	6,678	1,905	274	6,480	22,759	5	111,833	122,937	274,661
Outdoor Recreation Development	Acres	1,875	4,044	519	7,233	3,524	0	0	23,913	40,285	81,393
Wildlife Habitat Development	Acres	182	15,477	526	350	5,550	52	0	32,927	114,635	169,699
Forested Range Improvement	Acres	1,600	5,731	7,380	1,070	7,226	35	0	1,967	25,355	50,364
Forest Finance and Taxation Assistance	Number Assists	13	37	3	13	19	15	0	1,399	933	2,432
Insect and Disease Control Advice	Number Assists	316	10,095	90	237	4,177	234	0	3,661	12,392	31,312
Marketing Assistance to Landowners	M Cu. Ft.	3,495	4,968	104	54	11,785	25,407	0	74,301	39,894	160,008
Timber Sale Assistance:											
Preparation --	Acres	108,995	13,898	2,595	2,239	4,975	7,565	10	234,967	166,348	541,592
	M Cu. Ft.	17,567	3,946	562	1,456	23,923	5,357	40	68,266	133,519	274,655
Harvested --	Acres	86	10,811	10,831	248	502	14,162	0	177,170	113,421	327,231
	M Cu. Ft.	108	5,999	364	334	696	46,192	0	57,787	113,614	225,114
Harvesting Assistance to Loggers	M Cu. Ft.	7,551	3,909	1,278	505	2,265	10,936	400	28,295	15,511	70,650
Processing Assistance to Operators	M Cu. Ft.	6,336	6,275	1,751	110	56	7,832	0	20,930	46,566	89,906
Wood Typing Assistance	M Cu. Ft.	4	45	0	87	0	0	0	1,630	2,090	3,856
Processor Marketing Assistance	Number Assists	84	136	12	0	132	60	20	1,686	1,554	3,684
Urban and Community Forestry Activities	Urban Areas Assisted	90	405	18	67	229	31	1	1,553	4,106	6,508
Referrals to Consultants	Number	52	36	5	4	600	459	5	3,800	3,313	8,274

1/ Include Guam.

2/ Includes Puerto Rico and Virgin Islands.

TABLE B-6

Nursery Stock Available for Forest and Windbarrier Planting and Acres Planted or Seeded on Federal, State, and Private Lands

Fiscal Year 1978

State or Commonwealth	Planting stock produced, fiscal year 1978					Acres Planted or Seeded F.Y. 1978
	Federal Nurseries	State Nurseries	Other Public Nurseries	Selected Private/ Forest Industry Nurseries	Total Stock Available	
	Thousands					(Acres)
Alabama	-	54,900	-	39,523	94,423	78,103
Alaska	8	93	-	2	103	411
Arizona	-		68	73	141	7,222
Arkansas	-	15,484	-	27,000	42,484	86,886
California	20,500	3,954	250	20,500	45,204	106,142
Colorado	3,490	1,885	-	600	5,975	9,360
Connecticut	-	1,689	-	-	1,689	3,624
Delaware	-	800	-	-	800	3,140
Florida	300	48,290	-	62,853	111,443	154,591
Georgia	-	56,735	-	91,727	148,462	176,480
Guam	-	23	-	-	23	134
Hawaii	-	8,075	-	-	8,075	3,728
Idaho	23,567	635	140	1,600	25,942	24,778
Illinois	-	5,870	-	-	5,870	8,905
Indiana	-	4,900	-	1,000	5,900	2,845
Iowa	-	1,343	-	-	1,343	2,318
Kansas	-	1,335	-	250	1,585	2,873
Kentucky	-	9,476	-	-	9,476	28,222
Louisiana	404	53,604	-	9,500	63,508	109,620
Maine	-	1,767	-	5,700	7,467	8,955
Maryland	-	2,569	-	-	2,569	3,501
Massachusetts	-	-	-	-	-	214
Michigan	4,115	5,581	2,584	6,500	18,780	30,952
Minnesota	3,714	15,184	-	1,352	20,250	41,561
Mississippi	18,311	63,071	-	-	81,382	150,894
Missouri	-	10,776	-	-	10,776	10,087
Montana	-	953	-	540	1,493	21,305
Nebraska	2,709	3,200	37	232	6,178	7,619
Nevada	-	71	-	-	71	645
New Hampshire	-	803	-	-	803	888
New Jersey	-	812	-	-	812	792
New Mexico	1,163	-	72	26	1,261	4,044
New York	-	7,086	-	-	7,086	8,118
North Carolina	-	42,832	-	47,695	90,527	140,676
North Dakota	-	1,402	2,000	-	3,402	264
Ohio	-	7,148	-	250	7,398	7,817
Oklahoma	-	4,453	-	38,900	43,353	52,471
Oregon	12,622	30,000	-	57,410	100,032	256,432
Pennsylvania	-	6,425	3,500	60,000	69,925	23,705
Puerto Rico	60	976	-	-	1,036	671
Rhode Island	-	-	-	-	-	282
South Carolina	-	35,734	-	8,645	44,379	109,127
South Dakota	-	1,065	535	1,375	2,975	1,092
Tennessee	-	14,807	-	-	14,807	28,527
Texas	-	29,000	-	46,000	75,000	152,311
Utah	-	100	-	-	100	1,286
Vermont	-	263	-	-	263	4,196
Virgin Islands	-	10	-	-	10	8
Virginia	-	59,175	-	10,258	69,433	92,798
Washington	35,562	23,900	43	56,795	116,300	153,219
West Virginia	-	3,394	46	1,281	4,721	11,728
Wisconsin	-	13,774	-	2,000	15,774	35,579
Wyoming	-	-	-	-	-	5,119
Total	126,525	655,422	9 275	599,587	1,390,809	2,176,265

3. Cooperative Fire Protection

a. Cooperative Forest Fire Control

The Forest Service is authorized under the Cooperative Forest Fire Program (Clarke-McNary Act, Section 2) to provide technical and financial assistance to the States to strengthen their capabilities to provide for a fire organization. Nationally there are 1.1 billion acres of land that qualified for fire protection. FY 1978 targets were set to protect 838 million acres, keeping the number of person-caused fires at 142,600 and the number of acres burned at 2.1 million. Year-end accomplishment indicate that although only 749 million acres were provided protection the number of person-caused fires and acres burned were held to 141,956 and 2.1 million respectively (Table B-7).

The payoff has been in training of personnel, development and procurement of better fire equipment and tools, radio communications, implementation of knowledge gained in forest fire research, and direction of the nationwide forest fire prevention program.

The benefits from application of fire prevention and protection are in terms of timber yields, water quality, recreation opportunities, and improved and maintained fish and wildlife habitats, particularly those that are critical for threatened and endangered species.

In 1978, the Clarke-McNary Section 2 funding was increased, and because of this increase, the number of fire plans completed was over 20,000. Additional personnel were added in some States, resulting in an increase of over 30,000 man-days. New fire equipment was acquired and additional excess property equipment was converted. This resulted in over 1,200 additional vehicles being available for fire protection activities. Fuel and hazard reduction projects reduced the fire starting potential on over 20,000 acres of highly hazardous areas. New fire prevention programs were started in over 30 States during the year. A State breakdown of FY 1978 accomplishments is shown in Table B-7.

b. Rural Community Fire Program

Recognition that fires threaten lives and property on rural lands and that communities are lacking adequate fire protection facilities led to the authorization for the Rural Community Fire Protection Program.

The Rural Community Fire Program is designed to assist communities under 10,000 population with organizing, equipping, and training rural fire departments. It is estimated that there are over 46,000 such communities in the United States that have inadequate fire protection to meet State standards.

The program has been in demand. Over 3,000 communities received assistance in 1978. The direct results were 60,000 people trained; 64 new fire organizations formed; over 1,500 pieces of Federal excess equipment (communications, safety, etc.) converted or modified; and 114 vehicles converted to firetrucks by rural department volunteers. Generally, there has been about 10 percent increase over the 1977 accomplishments.

The program is providing the capability of rural America to prevent and control fires. The resultant of well-organized, equipped, and trained firefighting forces encourages and safeguards investments that in turn improve and develop the quality of life in rural America.

c. Smokey Bear

The Smokey Bear Cooperative Forest Fire Prevention Campaign, through the cooperation of the advertising industry and the National Association of State Foresters, continues to make great strides in reducing man-caused forest fires.

Through The Advertising Council, Inc., efforts with the mass media outlets of radio and television, the Smokey Bear program received public service time estimated to be worth more than $55 million.

The success of two separate mailings of the 1978 public service radio annuncements again strengthens the traditional message of Smokey Bear, REMEMBER--ONLY YOU CAN PREVENT FOREST FIRES.

TABLE B-7*

Wildfires on State and Private Areas Protected Under the
Clarke-McNary Act, Section 2
Calendar Year 1978*

State	Area Protected (Thousand Acres)	Man-caused Fires (Number)	Man-caused Area Burned (Acres)
Alabama	25,029	8,495	256,809
Alaska	22,052	280	47,786
Arizona	18,328	210	5,644
Arkansas	20,698	4,388	85,454
California	33,284	9,610	165,200
Colorado	11,945	730	6,483
Connecticut	2,390	1,170	2,964
Delaware	557	053	550
Florida	26,243	11,067	230,719
Georgia	27,279	15,143	79,603
Hawaii	3,306	888	6,495
Idaho	7,127	724	9,884
Illinois	8,453	314	6,940
Indiana	7,328	356	3,678
Iowa	7,612	2,040	44,435
Kansas	19,792	1,746	61,584
Kentucky	17,275	3,487	94,550
Louisiana	20,939	6,991	93,621
Maine	17,743	975	10,127
Maryland	3,700	806	5,060
Massachusetts	3,581	8,922	12,026
Michigan	19,675	1,433	12,109
Minnesota	22,830	1,801	180,854
Mississippi	19,858	8,620	115,747
Missouri	15,696	3,579	34,800
Montana	18,326	499	7,554
Nebraska	27,154	1,763	13,015
Nevada	8,777	186	3,773
New Hampshire	4,631	1,087	623
New Jersey	2,705	2,306	39,387
New Mexico	40,199	349	26,336
New York	16,958	895	7,016
North Carolina	20,819	5,447	39,686
North Dakota	228	007	118
Ohio	5,823	1,073	4,348
Oklahoma	5,007	1,726	67,465
Oregon	13,099	1,182	4,971
Pennsylvania	19,541	1,628	10,403
Rhode Island	512	713	794
South Carolina	13,289	7,989	32,664
South Dakota	25,816	535	6,952
Tennessee	12,478	6,662	75,268
Texas	22,123	2,870	43,790
Utah	14,724	408	6,045
Vermont	4,638	320	451
Virginia	18,595	4,405	11,476
Washington	13,177	1,142	9,936
West Virginia	12,833	2,504	44,647
Wisconsin	18,898	1,861	48,806
Wyoming	25,540	571	16,269
Totals	748,692	141,956	2,094,915

*CY 1977 Data reported-
1978 figures not available

4. Forest Insect And Disease Management

Forest Insect and Disease Management's degree of involvement in the recommended renewable resource program is directly related to the targets and goals of the different resource systems in protecting National Forest System, State, and private lands. The 1975 RPA recommended high program target was not accomplished in FY 1978 for both insect and disease surveys and suppression. These targeted activities were funded at historic program and project levels that were below the high RPA estimates proposed in the recommended program. Suppression targets were also lower due to decreased outbreaks of southern and mountain pine beetles. Some major accomplishments during fiscal year 1978 are described in the following paragraphs.

A large-scale mountain pine beetle demonstration project along the Front Range of Colorado on National Forest, State, and private lands was implemented. This project demonstrates that through proven bark beetle prevention measures, outbreaks of bark beetles can be reduced; the beauty, wildlife, and recreation opportunities can be increased; and the likelihood of forest devastation by fire can be controlled. This project is a success. Cooperation of municipal, county, State, and Federal governments, and the public in all disciplines of resource management, working together in a common cause, has contributed to the success of this effort.

Several seed orchard suppression projects in the South were implemented to reduce the losses caused by seed and cone insects. Some 60,000 trees were treated for the purpose of enhancing the production of genetically superior tree seed and managing orchards for maximum seed production to meet the requirement for reforestation.

Forty five pilot and loss assessment projects were implemented to evaluate promising insect and disease suppression methods, new techniques and methodologies, and to assess the losses being caused to the forest ecosystem by insects and diseases. Examples of these accomplishments are:

--In the Northeast, the biological insecticide, Bacillus thuringiensis (B.t.) was effective in suppressing the gypsy moth and spruce budworm in limited operational spray projects in Pennsylvania and Maine, respectively.

-- The biological nucleopolyhedrosis virus was shown to be effective in suppressing the Douglas-fir tussock moth in New Mexico.

-- Preventive sprays of Sevimol-4 were effective in protecting individual lodgepole pine trees from mountain pine beetle in administrative use and recreation areas in Montana.

Some bark beetle outbreaks were on the downtrend in the United States during 1978. Suppression and integrated pest management strategies were effective in reducing southern pine and mountain pine beetle infestations. Salvage and removal of infested trees greatly helped to reduce beetle population buildup and spread. In the South, 5.8 million cubic feet of timber were salvaged. In the West, 6.7 million cubic feet of timber were protected by removing 3.7 million cubic feet of sawtimber in mountain pine beetle infested areas.

About 8 million acres of spruce fir type in Maine were infested by the eastern spruce budworm in 1977. A cooperative suppression project with Maine was accomplished in 1978 on 1.3 million acres using insecticides Sevin 4-Oil, Orthene, Dylox, and Bacillus thuringiensis (B.t.).

A total of 1.3 million acres of forests in the Northeastern United States were defoliated by the gypsy moth in 1978. This was 325,000 acres less than 1977. Cooperative suppression efforts were accomplished in Pennsylvania on 135,166 acres and in New Jersey on 34,512 acres during 1978 using insecticides Sevin 4-Oil, Dylox, and B.t. Sevin 4-Oil gave the best population reduction and foliage protection.

Dwarf mistletoe surveys and suppression projects were performed in six Western regions. A total of 149,722 acres were surveyed and 24,000 acres were silviculturally treated to suppress the disease.

Environmental quality effects are considered and evaluated in undertaking any insect and disease suppression effort. For all suppression project an environmental assessment is made that considers the alternative courses of action available to suppress the insect or disease outbreak. Suppression measures are used only when absolutely necessary and after determining that the benefits of treatment outweigh the adverse effects of allowing the outbreak to go unchecked.

In 1978, the Forest Service gave increased emphasis to preventing insect and disease damage through integration of pest management principles into forest management. An example is the inclusion of pest risk assessment as a criterion for prioritizing stands to receive silvicultural treatment. Increased emphasis was also given to lessening dependence on chemical pesticides. An example of this was the use of Bacillus thuringiensis (B.t.) to control gypsy moth at Grey Towers near Milford, PA.

A comprehensive review of the forest pest management program was initiated. Scheduled to be completed in the spring of 1980, this review will look at all phases of the program, including pest management approaches and strategies, Forest Service philosophy and policies, decisionmaking processes, technical assistance delivery systems, and supporting research programs. It will be conducted by an outside contract.

C. NATIONAL FOREST SYSTEM

1. Recreation and Wilderness Management

a. Cultural Resources

Cultural resource surveys exceed the 1978 Resource Planning Assessment (RPA) target. This was the result of an intensive recruitment program for archeologists. Currently, there are 72 full-time archeologists in the Forest Service. The archeologists identified 6,480 prehistoric and historic properties on National Forest land as possible candidates for inclusion in the National Register of Historic Places.

b. Dispersed Recreation Use

The continued emphasis on programs that provide for more dispersed recreation opportunities is resulting in increased dispersed recreation use. The 138.9 million visitor days of dispersed use for 1978 is a 6-percent increase over 1977. This use exceeds the projected RPA estimate of 137 million visitor days by 1.4 percent.

The most important factor contributing to this increase is the effort to provide more information about these opportunities to the public. The HOST Program, which highlights the role field personnel have in enhancing the visitor's experience, is facilitating this flow of information. Other efforts include identification of opportunities through planning, improving signing, literature development, and development of reference books for public use at some field offices.

c. Off-Road Vehicle Management

In compliance with Executive Order 11644 (as amended by E.O. 11989) initial off-road vehicle (ORV) management plans have been implemented on 97 percent (181.5 million acres) of National Forest System lands. Off-road vehicle controls on selected portions of the remaining 3 percent (6.3 million acres) are pending resolution of ORV plan appeals or the incorporation of ORV plans into forest land management plans.

Due to a misinterpretation of data, the status of National Forest ORV management programs for 1977 stands corrected as follows:

123.7 million acres (66 percent) open to ORV use (significant portion is inoperable).

31.3 million acres (17 percent) restricted to specific vehicles or seasons of use.

32.8 million acres (17 percent) closed to all ORV use (includes wilderness and primitive areas).

The status of National Forest ORV management designations for 1978 is:

125.2 million acres (67 percent) designated open to ORV use

23.9 million acres (13 percent) restricted by plans to specific vehicle types or seasons of use

38.7 million acres (20 percent) closed to all ORV use (includes approximately 18 million acres of wilderness and primitive areas)

The acreage of National Forest lands shown in the "open" designation includes 69 million acres that cannot be used by ORV's because of topography, vegetation, or other natural barriers.

d. Wilderness Management

The Endangered American Wilderness Act of 1978 (P.L. 95-237) established 13 new wildernesses (1,053,865 acres) and added 228,460 acres to four designated wildernesses. These areas are located in 10 western States (See table C-1). In addition, P.L. 95-249 designated the Absaroka-Beartooth Wilderness in Montana (904,500 acres). These actions brought the total National Forest wildernesses to 14.8 million acres as of September 30, 1978.

At the close of the fiscal year, Congress was considering legislation involving an additional 13 areas, including Alaska.

Visitor-day usage of wilderness rose from 8 million in 1977 to 8.6 million in 1978. This is a 23-percent increase over the RPA Program. This trend is expected to continue as the wilderness system is expanded.

e. Roadless Area Review and Evaluation (RARE II)

RARE II is an acceleration of the allocation portion of the traditional land management planning process. It will achieve a timely determination of wilderness and nonwilderness use for National Forest roadless areas which is essential to assure a stable land base on which to build a balanced National Forest program. RARE II involved significant resource conflicts which required the professional expertise of the Forest Service, the judgment of USDA on National implications, and the benefit of public opinion to resolve.

The RARE II Draft Environmental Statement was issued June 15, 1978. The 3-1/2 month public comment period closed on October 1. During this time the Forest Service received and processed 264,093 responses. This figure represented 359,414 individuals; responses came from all 50 States. The public comment was evaluated and analyzed at a content analysis center established especially for that purpose in Salt Lake City, Utah.

Secretary Bergland announced the filing of the final environmental statement with EPA on January 4, 1979.

f. Trails Management - Program Accomplishment FY 1978

The key to accomplishing the Recreation goal is to develop and maintain a trail system which provides a full spectrum of trail-related recreation opportunities commensurate with land capability and public need. The RPA goal is to have about 120,000 miles of trail within the National Forests by the year 2020. There are now about 97,000 miles of trails in the National Forests.

The Human Resource Programs such as YACC, YCC, and Volunteers in the Forest Service were able to complete approximately 2,120 miles.

National Recreation Trails--The goal is to have 250 National Recreation Trails by 1980. As of January 1, 1979, there were 69 National Recreation Trails within the National Forests amounting to approximately 900 miles. Fifty-six National Recreation Trails were designated and another thirty-three are undergoing interagency review.

National Scenic Trails--The goal is to complete the Appalachian National Scenic Trail through the National Forests by 1981 and the Pacific Crest National Scenic Trail by 1986. The status of these trails is:

	Total Miles Planned	Miles to Standard	Private Land to Secure
Appalachian trail.....	840	717 1/	46
Pacific Crest Trail ..	2,500	1,400 2/	447

1/ about 70 miles were constructed or reconstructed in FY 1978

2/ about 300 miles were constructed or reconstructed in FY 1978

g. Landscape Management

The five chapters of the National Forest Landscape Management series continue to be in demand from universities, other Government Agencies, and the public. These handbooks provide a vocabulary, planning and objective-setting process, and practical ideas for the application of design principles to land management activities.

First draft manuscripts for two more chapters, "Timber" and "Wildlife," are complete. They will illustrate methods of combining visual resource management with silviculture and wildlife habitat manipulations to achieve attractive as well as productive forest landscapes.

Cooperation with the American Society of Landscape Architects resulted in two additional publications, one on visual resource management in the United States, and the other on "Creating Land for Tomorrow." The latter deals with surface mining and opportunities for reclaiming or creating useful as well as attractive landscapes after mining.

Forest Service Regions performed analysis and mapping on approximately 40 percent of the area which must meet visual quality objectives. This input insures consideration of the scenic aspects of these lands as their future direction is shaped in the National Forest land management process.

h. Developed Recreation Opportunities by the Private Sector

Private parties may obtain special use permits to occupy National Forest land, then develop and offer recreation opportunities to the general public. The number of permits administered in FY 1978 are:

Recreation Residences	17,220
Winter Sports Areas	218
Organization Camps	542
Lodges and Resorts	363
Outfitting and Guiding	2,300
	20,643 permits

In FY 1978, recreation residences and winter sports areas under permit paid National Forests more than $6 million. These two activities were the largest contributors of recreation fees paid to the Forest Service.

The Forest Service has one year's experience in collecting and analyzing data about the utilization of skiing capacities to determine if competitive forces are operating in a way that provides reasonable

ski lift ticket prices. Based on this experience, the Forest Service will not limit ski lift ticket prices at most ski areas operating on National Forests for the 1978-79 season. In the coming year, emphasis on developing further rationale for approving list ticket prices will continue.

Concessioners occupying National Forest lands for the purpose of providing commercial facilities and services to recreation visitors pay a fee for the privilege, based on a graduated system which recognize investment and gross revenue. Responding to concerns expressed by field offices and concessioners, the Forest Service undertook a study of the Graduated Rate Fee System with the objective of simplifying, improving, and updating it. Utilizing financial data furnished by concessioners, a draft of the modified system was completed in 1978 and will be subject to public review.

i. Management of Developed Recreation Sites and Facilities

In FY 1978, 79.6 million visitor days of recreation use occurred on National Forest developed sites. This is slightly higher than the FY 1978 RPA estimate. This indicates the general public is turning to the National Forests for outdoor recreation in ever-increasing numbers.

These visitors were accommodated at 4,450 campgrounds, 1,443 picnic sites, 311 swimming sites, 930 boating sites, 584 interpretive and information sites, and 588 observation and other sites operated by the Forest Service. Some of the use also occurred at winter sports areas, organization camps, lodges and resorts, and other concessions authorized by special use permit.

A full level of services was provided at 65 percent of the sites. The remaining 35 percent were operated at a reduced level of services because of budget constraints.

Recreation users paid fees at 1,968 sites. Total fees amount to slightly more than $6 million. They range from $1 to $5 per day per camp unit.

The major thrust of recreation construction was toward rehabilitating existing unsafe or unsanitary facilities. New construction will provide facilities that will accommodate 5,500 people at one time.

j. Visitor Information Service

During the year the Visitor Information Service (VIS) provided primary staff support for the Forest Service's Host program. Specific activities included primary staff support to national and regional level steering committees, drafting an action plan for the next several years, and developing and providing initial training in several of the Regions.

The National Forest Management Act provides for integrated natural resource management plans on each of the National Forests. VIS involvement in these plans assures adequate consideration of visitor services.

In May, the Seneca Rocks Visitor Center in West Virginia was dedicated and opened. This center provides orientation to the many outdoor recreation opportunities available on lands managed by the Forest Service.

Planning also continued for major updating or new construction of visitor service facilities at Portage Glacier, Alaska; Flamming Gorge National Recreation Area, Utah; Sabino Canyon, Arizona; Pactola Reservoir, South Dakota, and Chilao Visitor Center, California.

An Interagency Task Force on Interpretation was set up to provide monthly interchange of ideas among Federal Agencies, representatives from professional interpretive associations, and the Smithsonion Institution. As a result, an exchange program between university staff and Forest Service staff developed. A university professor in interpretation joined VIS for one year under the exchange program authorized by the Intergovernmental Personnel Act of 1970.

TABLE C-1

ADDITIONS TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM CONGRESSIONALLY DESIGNATED IN FY 1978

AREA #	Pl #	Forest	State	Date	Acres
Pusch Ridge	95-237	Coronado	Arizona	2/24/78	56,430
Golden Trout	95-237	Inyo, Sequoia	California	2/24/78	302,800
Santa Lucia	95-237	Los Padres	California	2/24/78	18,210
Ventana Add.	95-237	Los Padres	California	2/24/78	58,700
Hunter Fryingpan	95-237	White River	Colorado	2/24/78	74,250
Gospel Hump	95-237	Nezperce	Idaho	2/24/78	205,900
Welcome Creek	95-237	Lolo	Montana	2/24/78	28,440
Clama River Canyon	95-237	Carson, Santa Fe	New Mexico	2/24/78	50,260
Mangano Mtn.	95-237	Cibola	New Mexico	2/24/78	36,680
Sandia Mtn.	95-237	Cibola	New Mexico	2/24/78	30,900
Kalmiopsis Add.	95-237	Siskiyou	Oregon	2/24/78	92,000
Mt. Hood Add.	95-237	Mt. Hood	Oregon	2/24/78	32,360
Three Sisters Add.	95-237	Willamette	Oregon	2/24/78	45,400
Wild Rogue	95-237	Siskiyou	Oregon	2/24/78	25,658
Lone Peak	95-237	Uinta, Wasatch	Utah	2/24/78	29,397
Wenaha-Tucannon	95-237	Umitilla	Oregon/Wash.	2/24/78	180,000
Savage Run	95-237	Medicine Bow	Wyoming	2/24/78	14,940
Absaroka-Beartooth	95-249	Custer, Gallatin	Montana	3/27/78	904,500
TOTAL					2,186,825

TABLE C-2a

NATIONAL FOREST RECREATION
STATE SUMMARY OF RECREATION USE
PART I - USE OF DEVELOPED RECREATION SITES F.Y. 1978
THOUSANDS OF VISITOR-DAYS OF RECREATION USE 1/

STATE NAME	OBSERV. SITE	PLAY, PARK, SPORTS	BOATING SITE	SWIMMING SITE	CAMP-GROUNDS	PICNIC GROUNDS	HOTEL, LODGE, RESORTS	ORGANI-ZATION SITES	OTHER CONC. SITES	RECN RES. SITES	WINTER SPORTS SITES	DOC. SITES	INTERP-RETIVE SITES	TOTAL USE	PERCNT OF TOTAL
ALABAMA			5.8	73.8	176.6	12.6							2.9	271.7	.3
ALASKA	49.6	7.3	5.4	1.7	397.3	39.0	16.3	12.3		28.9	69.3		107.8	734.9	.9
ARIZONA	46.6	50.4	235.6	65.0	2850.8	485.1	291.5	387.3	54.2	428.6	35.9	1.4	74.5	5006.9	6.3
ARKANSAS	36.3		7.6	99.4	451.1	81.1	13.9	17.8		8.5			32.4	748.1	.9
CALIFORNIA	64.4	71.8	449.9	241.7	9862.8	1178.6	1455.0	2358.7	173.9	3214.8	2648.2	.8	248.0	21968.6	27.6
COLORADO	84.6	1.8	42.7		3406.7	496.7	222.4	216.5	174.3	283.5	3569.1	18.7	51.9	8558.9	10.8
FLORIDA			49.3	130.0	772.4	293.5		90.1		132.9		3.3	16.9	1488.4	1.9
GEORGIA	31.2		15.3	11.6	265.8	36.4		28.8		16.5			19.5	425.1	.5
IDAHO	11.7	1.0	158.5	30.3	1793.0	168.5	173.9	204.7	10.8	292.1	228.6	16.0	103.4	3192.5	4.0
ILLINOIS	26.0		13.5	21.0	85.9	46.6						.2	3.9	197.1	.2
INDIANA	.2		21.8	23.2	120.1	20.9							5.1	191.3	.2
KANSAS						6.0								6.0	
KENTUCKY	64.0	.2	72.4	10.4	250.6	93.4		15.3		11.2		.5	3.7	521.7	.7
LOUISIANA	2.1		16.4	34.3	113.6	12.5		14.9		25.6			31.5	250.9	.3
MAINE	2.6				18.2	2.5		1.3			68.4		.5	93.5	.1
MICHIGAN	34.7	4.7	129.7	94.0	689.5	140.7	2.6	26.5	.8	94.1	147.0	2.4	12.3	1379.0	1.7
MINNESOTA	2.5		122.6	43.0	653.8	51.5	120.1	119.9	3.1	150.3	30.6	.6	2.7	1300.7	1.6
MISSISSIPPI			19.4	74.8	82.8	23.7		45.3					1.9	247.9	.3
MISSOURI	2.2		27.2	3.4	215.8	94.3		29.2				.3	2.7	375.1	.5
MONTANA	14.9		85.4	27.6	1323.9	149.6	90.4	133.7	1.3	257.0	371.3		123.8	2578.9	3.2
NEBRASKA	.1			1.6	18.3	22.7		18.6				.1		51.4	.1
NEVADA	2.9	6.6		45.7	394.5	124.6		49.0		21.8	123.2		53.8	822.1	1.0
NEW HAMPSHIRE	72.8		7.9	26.9	541.1	60.9	84.8	3.2			281.9		11.4	1090.9	1.4
NEW MEXICO	79.3		55.1		1590.7	291.4	7.9	58.4	24.7	111.9	297.7	8.5	104.8	2630.4	3.3
NEW YORK					7.6	1.9								9.5	
NORTH CAROLINA	131.2		24.0	82.1	554.6	253.1	15.2			4.4		.2	66.8	1131.6	1.4
NORTH DAKOTA					14.3	.8								15.1	
OHIO			2.4	7.6	38.8	12.7							.9	62.4	.1
OKLAHOMA	16.2		6.2	11.4	28.7	14.0							5.8	82.3	.1
OREGON	140.9	7.2	364.9	45.9	3957.7	496.5	878.4	292.7	103.7	404.7	668.0	8.1	125.6	7494.3	9.4
PENNSYLVANIA	43.8	.2	25.7	36.8	408.5	14.3		28.6		55.4			4.4	617.7	.8
SOUTH CAROLINA		7.9	9.1	12.1	112.8	47.8		2.6				.3	1.2	193.8	.2
SOUTH DAKOTA	22.8	2.2	22.1	23.9	333.4	52.6	5.5	41.7	24.0	71.2	8.5		4.5	612.4	.8
TENNESSEE	55.4	3.5	14.0	67.6	412.0	166.6	29.4	44.5	2.3	78.8		.1	12.9	887.1	1.1
TEXAS	.3		30.4	36.5	216.2	41.1	14.7		19.6				4.8	363.6	.5
UTAH	38.4	3.3	115.2	36.8	2603.3	307.6	289.3	224.6	25.7	281.3	327.6	.2	31.7	4285.0	5.4
VERMONT	1.9	2.0		.1	31.9	6.5	15.3	11.0		.9	343.9		1.0	414.5	.5
VIRGINIA	22.8	2.6	5.1	36.2	397.4	113.5		44.9	1.1	.6		.8	24.6	649.6	.8
WASHINGTON	56.0		97.5	21.4	2617.6	113.7	339.9	435.6	7.5	322.5	1149.4	.5	20.3	5181.9	6.5
WEST VIRGINIA	6.9		1.0	22.7	324.5	44.6		54.8		.7		4.5	4.3	464.0	.6
WISCONSIN			48.1	54.3	391.2	16.3	2.4	1.1	1.0	8.0	12.4		5.9	540.7	.7
WYOMING	22.3		59.7	12.3	1081.1	72.0	287.7	138.0	2.7	194.2	220.0	.9	31.6	2122.5	2.7
PUERTO RICO	47.1					141.2		57.0	10.0	4.0			91.2	350.5	.4
SERVICE WIDE	1234.7	172.7	2366.9	1567.1	39606.9	5849.6	4356.6	5208.6	640.7	6504.4	10601.0	68.4	1452.9	79630.5	100.0

1/ Recreation use of National Forest land and water which aggregates 12 person-hours. May entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittant.

TABLE C-2b

NATIONAL FOREST RECREATION
STATE SUMMARY OF RECREATION USE
PART I Cont. - USE OF DISPERSED RECREATION AREAS F.Y. 1978
THOUSANDS OF VISITOR-DAYS OF RECREATION USE 1/

STATE NAME	ROADS	TRAILS	LAKES/PONDS	RESER-VOIRS	RIVERS/ STREAMS	OCEANS/ GREAT LAKES	GENERAL UNDEVELOPED AREA	TOTAL USE	TOTAL USE DEVELOPED & DISPERSED	FY 1978 USE (RECREATION DAYS) 2/
ALABAMA	372.5	14.2	3.4	85.2	56.0		344.2	885.5	1,157.2	3,593,278
ALASKA	331.0	123.6	113.0	.4	109.0	1,919.8	200.9	2,797.7	3,532.6	14,020,468
ARIZONA	2,609.5	742.0	4.7	837.9	319.2		2,291.5	6,804.8	11,811.7	36,835,040
ARKANSAS	284.9	62.2		451.9	207.1		1,083.5	2,089.6	2,837.7	8,804,174
CALIFORNIA	14,758.5	2,148.3	748.3	2,712.0	2,209.1		10,093.6	32,669.8	54,638.4	353,273,213
COLORADO	4,735.0	1,723.6	369.6	587.3	685.3		4,554.3	12,665.1	21,234.0	102,553,214
FLORIDA	277.1	28.3	546.0	13.2	177.7		993.1	2,035.4	3,523.8	8,773,924
GEORGIA	429.6	155.9		105.0	176.1		552.2	1,418.8	1,843.9	5,747,471
IDAHO	2,207.7	480.7	270.1	353.9	699.5		2,667.4	6,679.3	9,871.8	33,214,435
ILLINOIS	199.9	73.3	.4	102.0	27.8		420.8	824.2	1,021.3	3,448,218
INDIANA	133.2	16.7		204.1	29.1		213.1	596.2	787.5	2,301,705
KANSAS	18.8			1.1			5.0	24.9	30.9	271,436
KENTUCKY	784.7	139.6		432.7	176.1		374.1	1,907.2	2,428.9	8,347,442
LOUISIANA	87.7	24.3		38.6	30.3		180.2	361.1	612.0	2,513,134
MAINE	11.7	7.5	2.5	.9	2.7		13.7	39.0	132.5	357,222
MICHIGAN	2,035.5	178.5	370.6	24.8	294.4	3.0	1,217.0	4,123.8	5,502.8	14,951,898
MINNESOTA	607.0	153.2	1,222.9	5.6	191.8		924.0	3,104.5	4,405.2	11,826,023
MISSISSIPPI	197.9	18.4	4.0	45.9	49.6		474.6	790.4	1,038.3	2,861,075
MISSOURI	404.4	50.1	.2	63.1	177.1		380.9	1,075.8	1,450.9	4,109,519
MONTANA	2,163.6	569.1	263.7	213.9	433.1		2,047.9	5,691.3	8,270.2	24,850,963
NEBRASKA	23.3	7.0		9.5	.6		66.9	107.3	168.7	1,000,840
NEVADA	498.4	72.6	8.6	2.2	92.8		455.6	1,130.2	1,952.3	11,581,662
NEW HAMPSHIRE	540.7	872.1	8.8	2.1	44.8		432.1	1,900.6	2,991.5	11,884,596
NEW MEXICO	1,035.8	318.0	29.9	125.9	206.8		1,748.0	3,464.4	6,094.8	20,847,774
NEW YORK	.7	2.7		.8			4.2	8.4	17.9	45,901
NORTH CAROLINA	1,375.7	263.6	8.1	143.7	282.7		967.5	3,041.3	4,172.9	16,696,484
NORTH DAKOTA	31.3			8.0	5.2		69.5	114.0	129.1	422,862
OHIO	68.9	3.3		16.7	20.0		198.5	307.4	369.8	1,077,240
OKLAHOMA	202.8	14.1		27.2	13.4		129.1	386.6	468.9	2,044,364
OREGON	3,107.4	597.5	598.6	442.6	894.3		3,935.7	9,576.1	17,070.4	44,578,036
PENNSYLVANIA	430.4	18.7		117.6	98.8		626.4	1,291.9	1,909.6	5,466,038
SOUTH CAROLINA	246.6	25.1	.3	57.1	122.7		272.0	723.8	917.6	2,877,252
SOUTH DAKOTA	1,370.6	18.4		129.0	35.1		257.1	1,810.2	2,422.6	19,646,796
TENNESSEE	368.4	137.4		95.3	174.8		387.6	1,163.5	2,050.6	6,414,679
TEXAS	215.9	12.2	.8	931.8	19.9		299.0	1,479.6	1,943.2	4,559,550
UTAH	2,838.5	542.3	204.5	634.4	465.8		2,809.7	7,495.2	11,780.2	39,957,476
VERMONT	75.3	27.5	2.5	1.1	5.5		75.5	187.4	601.9	1,946,144
VIRGINIA	1,030.5	203.2		101.4	208.9		1,093.1	2,637.1	3,286.7	11,457,535
WASHINGTON	3,507.9	958.7	362.1	107.8	508.6	7.6	3,422.9	8,875.6	14,057.5	37,222,244
WEST VIRGINIA	322.4	73.7	.5	44.5	219.0		521.2	1,181.3	1,645.3	4,262,873
WISCONSIN	584.4	67.3	238.9	13.9	85.5		435.1	1,425.1	1,965.8	5,340,512
WYOMING	1,430.1	315.6	184.4	103.7	353.9		1,413.1	3,800.8	5,923.3	27,648,248
PUERTO RICO	60.9	18.0			82.0		10.7	171.6	522.1	3,460,302
SERVICE WIDE	52,017.1	11,278.5	5,567.4	9,395.8	10,002.1	1,930.4	48,672.5	138,863.8	218,494.3	824,835,230

1/ Recreation use of National Forest land and water which aggregates 12 person-hours. May entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittant.

2/ The Heritage Conservation and Recreation Service (HCRS) has used the "Recreation Day" as a common basis for displaying recreation use on Federal lands administered by the seven Federal land managing agencies. A Recreation Day is defined as the presence of one person on an area of land or water for the purpose of engaging in one or more recreation activity during all or part of a calendar day.

TABLE C-3

NATIONAL FOREST RECREATION
STATE SUMMARY OF RECREATION USE
PART 2 - SUMMARY OF ACTIVITIES
FISCAL YEAR 1978
THOUSANDS OF VISITOR-DAYS OF RECREATION USE 1/

STATE NAME	CAMPING	PICNICKING	REC.TRAVEL (MECHANIZED)	BOATING	GAMES & TEAM SPORTS	WATERSKIING AND OTHER WATER SPORTS	SWIMMING AND SCUBA DIVING	WINTER SPORTS	FISHING	HUNTING
ALABAMA	202.2	68.7	347.7	39.1	.7	13.0	82.9		72.1	213.9
ALASKA	362.4	56.4	361.8	1,381.7	9.9	1.0	14.1	106.6	378.9	146.4
ARIZONA	3,394.1	789.4	2,602.5	434.7	104.8	52.9	253.5	130.8	675.4	612.0
ARKANSAS	605.9	157.4	513.9	145.2	2.2	28.5	206.2		356.6	484.5
CALIFORNIA	14,990.4	1,429.2	14,433.8	1,305.2	285.3	334.3	1,587.3	3,017.7	3,132.2	1,480.6
COLORADO	5,100.1	734.6	4,745.0	190.9	21.4	11.7	46.0	3,692.8	1,475.6	893.8
FLORIDA	1,205.9	317.5	249.1	202.5	5.9	47.6	259.4		374.4	460.2
GEORGIA	445.9	54.1	407.1	54.3	3.5	27.2	21.8	2.2	194.9	290.0
IDAHO	2,737.8	389.0	2,373.5	306.4	35.6	34.2	172.5	304.6	929.4	764.9
ILLINOIS	149.8	66.1	226.1	41.8	.8	7.9	32.2		52.1	211.6
INDIANA	160.8	29.3	102.0	85.5		27.4	25.7		127.4	107.8
KANSAS	1.4	6.5	18.6	.1	.1		.1	.1	.5	1.8
KENTUCKY	279.0	111.9	691.5	338.8	4.8	62.8	41.2		224.0	175.3
LOUISIANA	129.5	38.8	85.1	21.5	2.7	3.1	24.3		45.6	124.3
MAINE	18.2	4.0	16.6	.2	.8		6.2	10.9	4.5	9.5
MICHIGAN	948.9	138.5	2,251.7	261.1	8.5	8.8	123.9	196.3	415.6	661.6
MINNESOTA	1,241.2	60.5	695.7	625.8	12.2	29.7	107.6	106.5	755.5	252.1
MISSISSIPPI	135.4	50.0	184.8	47.1	1.8	4.2	58.6		42.1	401.6
MISSOURI	313.2	80.9	389.5	105.1	8.1	21.6	64.3		89.9	199.3
MONTANA	1,704.0	337.9	2,258.2	164.5	26.3	35.0	65.5	486.6	732.7	710.4
NEBRASKA	28.7	23.5	16.4	1.5	2.4	.1	2.4		7.4	27.1
NEVADA	458.9	213.2	303.8	1.0	19.6	.2	61.4	149.0	92.4	119.6
NEW HAMPSHIRE	727.8	75.8	407.4	4.1	1.8	7.1	47.3	313.1	21.5	32.1
NEW MEXICO	1,751.1	530.4	1,054.0	18.3	25.0	.1	23.8	283.8	369.0	443.0
NEW YORK	9.2	1.2	1.1					.4	.7	2.2
NORTH CAROLINA	744.4	196.4	1,387.7	125.9	7.4	18.7	111.8	1.2	220.3	481.9
NORTH DAKOTA	12.2	7.2	25.3	2.2	.1		.9	1.6	7.5	50.8
OHIO	61.6	20.1	78.1	8.3	2.5	.4	9.9	.4	22.2	105.6
OKLAHOMA	45.6	27.5	200.7	13.7		2.1	12.9		27.3	59.2
OREGON	5,239.9	755.8	3,064.5	663.6	37.3	75.7	301.0	782.2	1,299.1	1,160.9
PENNSYLVANIA	471.7	34.1	336.5	87.2	1.4	5.8	23.3	1.4	222.8	430.1
SOUTH CAROLINA	135.2	48.1	240.8	62.6	11.4	12.5	10.6		101.7	199.3
SOUTH DAKOTA	321.0	75.9	1,383.9	35.5	8.4	7.1	51.5	23.7	101.2	122.5
TENNESSEE	533.5	170.0	383.1	72.6	9.6	25.2	108.7	.2	128.5	189.0
TEXAS	347.4	40.2	201.7	72.1		23.8	46.4		847.2	152.6
UTAH	3,728.8	688.4	2,776.4	226.1	71.7	22.9	85.8	359.7	1,032.6	703.5
VERMONT	47.9	6.9	104.8	2.5	2.4		1.8	265.3	4.7	26.8
VIRGINIA	705.1	143.5	900.0	16.6	15.7	1.5	51.8	6.1	279.7	519.7
WASHINGTON	3,957.6	378.6	2,668.9	226.2	38.4	13.9	102.6	1,235.0	716.0	960.0
WEST VIRGINIA	577.2	46.7	291.8	18.5	9.3		31.5	.3	239.7	211.0
WISCONSIN	431.6	29.3	650.6	109.7	.2	9.7	80.4	22.3	201.1	295.5
WYOMING	1,560.1	165.0	1,515.1	127.8	21.4	5.3	25.5	132.9	537.1	455.2
PUERTO RICO	3.5	164.3	22.4		4.0		57.2			
SERVICE WIDE	56,045.9	8,762.8	50,970.2	7,647.5	825.4	983.0	4,441.6	11,633.7	16,559.1	14,946.2

1/ Recreation use of National Forest land and water which aggregates 12 person-hours. May entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittant.

NATIONAL FOREST RECREATION
STATE SUMMARY OF RECREATION USE
PART 2 Cont. - SUMMARY OF ACTIVITIES
THOUSANDS OF VISITOR-DAYS OF RECREATION USE 1/
F.Y. 1978

HIKING & MOUNTAIN CLIMBING	HORSEBACK RIDING	RESORT USE	ORG. CAMP USE	REC. RES. USE	GATHERING FOREST PRODUCTS	NATURE STUDY	VIEWING SCENES, SPORTS ENVIRONMENT	VIS. (EXHIBITS, TALKS, ETC)	TOTAL USE	PERCENT OF TOTAL
38.6	14.7				36.3	13.1	3.3	10.9	1,157.2	.5
130.9	2.7	16.2	8.0	28.9	13.0	10.5	312.2	191.0	3,532.6	1.6
671.6	257.5	225.2	290.3	428.6	198.4	101.2	374.0	214.8	11,811.7	5.4
88.2	36.9	13.9	12.7	8.5	34.0	12.9	46.5	83.7	2,837.7	1.3
2,286.6	459.5	1,376.9	1,779.8	3,195.6	532.0	339.8	2,066.7	605.5	54,638.4	25.0
1,467.9	413.7	315.5	181.3	283.0	226.1	138.1	1,076.1	220.4	21,234.0	9.7
50.7	31.3		50.3	132.9	29.1	16.2	55.7	35.1	3,523.8	1.6
168.0	18.0		16.2	16.5	7.3	7.8	66.4	42.7	1,843.9	.8
340.3	205.9	167.0	158.9	297.1	260.8	35.0	192.9	166.0	9,871.8	4.5
51.0	58.6				5.5	3.1	71.5	23.2	1,021.3	.5
47.0	20.2				24.4	9.0	8.4	12.6	787.5	.4
.5	.2				.2	.8			30.9	
222.2	36.4	7.1	11.7	11.2	14.9	8.0	103.2	83.9	2,428.9	1.1
28.4	7.1		11.9	25.6	13.7	3.2	6.5	39.7	612.0	.3
6.9	.6	46.8	1.1		.4	2.3	2.6	.9	132.5	.1
109.4	29.6	3.3	18.0	94.1	60.7	33.6	83.2	56.0	5,502.8	2.5
76.4	5.4	84.7	19.1	150.3	37.6	51.9	20.0	73.0	4,405.2	2.0
23.0	16.0		41.4		14.5	3.7	4.6	9.5	1,038.3	.5
61.0	23.8		24.2		17.2	7.1	29.9	15.8	1,450.9	.7
379.2	229.3	108.4	104.5	256.6	137.7	44.7	191.0	297.7	8,270.2	3.8
11.8	2.9		11.1		9.2	9.0	3.7	11.5	168.7	.1
72.5	45.5	27.4	32.2	21.4	51.1	13.0	39.7	231.4	1,952.3	.9
761.5	.8	79.6	2.4		5.0	18.5	463.3	22.4	2,991.5	1.4
360.0	130.5	17.2	46.6	111.9	336.8	28.8	230.1	334.4	6,094.8	2.8
1.0	.9				.9	.3			17.9	
324.8	36.7	7.5		4.4	54.7	22.0	297.9	129.2	4,172.9	1.9
2.0	3.5				1.8	.4	11.3	2.3	129.1	.1
14.7	11.7				10.0	4.1	1.2	19.0	369.8	.2
22.7	4.5				5.1	3.0	31.9	13.7	468.9	.2
699.1	182.6	775.8	204.3	405.0	324.5	93.6	657.5	348.0	17,070.4	7.8
26.2	4.9	1.7	20.1	55.4	26.7	7.1	139.6	13.6	1,909.6	.9
26.3	18.9				18.1	8.8	8.9	14.4	917.6	.4
54.4	24.8	19.8	31.3	71.2	14.1	18.0	25.1	33.2	2,422.6	1.1
125.1	21.8	26.8	31.2	78.8	15.6	7.0	100.9	24.0	2,050.6	.9
18.6	5.5	20.9			2.3	8.0	40.2	16.3	1,843.2	.8
467.4	239.8	287.4	183.9	282.1	133.9	45.2	310.2	114.6	11,780.2	5.4
30.5	1.4	72.6	9.9	.9	1.4	.6	20.2	1.3	601.9	.3
199.7	62.4	1.0	31.9	.6	52.5	19.3	245.9	34.7	3,286.7	1.5
958.5	232.9	253.4	358.8	322.5	344.3	65.7	1,044.2	180.0	14,057.5	6.4
93.6	5.9		31.9	.7	18.1	4.4	16.8	47.9	1,645.3	.8
28.9	7.0	2.5	1.5	8.0	59.5	5.0	4.7	18.3	1,965.8	.9
328.7	126.0	301.5	98.2	194.2	44.5	31.7	113.3	139.8	5,923.3	2.7
29.8		10.0	32.0	4.0	2.5	1.8	31.5	159.1	522.1	.2
10,925.6	3,038.3	4,270.1	3,856.7	6,490.0	3,196.4	1,257.3	8,552.8	4,091.5	218,494.3	100.0

1/ Recreation use of National Forest land and water which aggregates 12 person-hours. May entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittant.

TABLE C-4a

NATIONAL FOREST RECREATION
REGIONAL SUMMARY OF RECREATION USE
PART I - USE OF DEVELOPED RECREATION SITES F.Y. 1978
THOUSANDS OF VISITOR-DAYS OF RECREATION USE 1/

REGION		OBSERV. SITE	PLAY, PARK, SPORTS	BOATING SITE	SWIMMING SITE	CAMP-GROUNDS	PICNIC GROUNDS	HOTEL, LODGE, RESORTS	ORGANI-ZATION SITES	OTHER CONC. SITES	RECN RES. SITES	WINTER SPORTS SITES	DOC. SITES	INTERP-RETIVE SITES	TOTAL USE	PERCNT OF TOTAL
01	USE	16.4		112.0	43.2	1840.3	236.0	121.9	135.1	7.0	316.7	392.3	3.8	159.5	3384.2	
	%	1.3		4.7	2.8	4.6	4.0	2.8	2.6	1.1	4.9	3.7	5.6	11.0	4.2	29.3
02	USE	125.4	4.0	79.9	25.5	4457.6	646.2	481.6	338.6	200.3	508.5	3617.6	19.6	72.9	10577.7	
	%	10.2	2.3	3.4	1.6	11.3	11.0	11.1	6.5	31.3	7.8	34.1	28.7	5.0	13.3	38.7
03	USE	125.9	50.4	310.7	65.0	4445.9	815.2	314.1	445.7	78.9	540.5	333.6	9.9	179.3	7715.1	
	%	10.2	29.2	13.1	4.1	11.2	13.9	7.2	8.6	12.3	8.3	3.1	14.5	12.3	9.7	42.7
04	USE	55.9	10.9	291.7	63.8	5080.9	528.8	522.7	553.1	37.9	606.2	765.4	12.5	168.3	8698.1	
	%	4.5	6.3	12.3	4.1	12.8	9.0	12.0	10.6	5.9	9.3	7.2	18.3	11.6	10.9	35.8
05	USE	65.3	71.8	449.9	287.4	9455.5	1168.7	1398.0	2358.7	167.5	3184.5	2721.2	.8	248.0	21577.3	
	%	5.3	41.6	19.0	18.3	23.9	20.0	32.1	45.3	26.1	49.0	25.7	1.2	17.1	27.1	40.6
06	USE	196.0	7.2	462.4	67.3	6572.3	610.2	1218.3	728.3	111.2	727.2	1817.4	8.6	145.9	12672.3	
	%	15.9	4.2	19.5	4.3	16.6	10.4	28.0	14.0	17.4	11.2	17.1	12.6	10.0	15.9	40.7
08	USE	406.6	14.2	255.2	687.7	3885.0	1298.0	58.5	361.9	33.0	283.2		5.2	316.3	7604.8	
	%	32.9	8.2	10.8	43.9	9.8	22.2	1.3	6.9	5.2	4.4		7.6	21.8	9.6	28.4
09	USE	193.6	6.9	399.7	325.5	3472.1	507.5	225.2	274.9	4.9	308.7	884.2	8.0	54.9	6666.1	
	%	15.7	4.0	16.9	20.8	8.8	8.7	5.2	5.3	.8	4.7	8.3	11.7	3.8	8.4	29.5
10	USE	49.6	7.3	5.4	1.7	397.3	39.0	16.3	12.3		28.9	69.3		107.8	734.9	
	%	4.0	4.2	.2	.1	1.0	.7	.4	.2		.4	.7		7.4	.9	20.8
SERVICE WIDE	USE	1234.7	172.7	2366.9	1567.1	39606.9	5849.6	4356.6	5208.6	640.7	6504.4	10601.0	68.4	1452.9	79630.5	
	%	.6	.1	1.1	.7	18.1	2.7	2.0	2.4	.3	3.0	4.9		.7	36.4	

1/ Recreation use of National Forest land and water which aggregates 12 person-hours. May entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittant.

TABLE C-4b

NATIONAL FOREST RECREATION
REGIONAL SUMMARY OF RECREATION USE
PART I Cont. - USE OF DISPERSED RECREATION AREAS F.Y. 1978
THOUSANDS OF VISITOR-DAYS OF RECREATION USE 1/

REGION	ROADS	TRAILS	LAKES/PONDS	RESER-VOIRS	RIVERS/ STREAMS	OCEANS/ GREAT LAKES	GENERAL UNDEVELOPED AREA	TOTAL USE	TOTAL USE DEVELOPED & DISPERSED
01	2,976.5	729.8	340.7	287.8	680.6		3,164.4	8,179.8	11,564.0
02	7,128.4	1,882.9	430.6	776.6	931.6		5,635.3	16,785.4	27,363.1
03	3,672.1	1,060.0	34.6	1,005.6	526.0		4,059.1	10,357.4	18,072.5
04	5,806.3	1,214.6	561.0	1,017.4	1,289.9		5,731.8	15,621.0	24,319.1
05	14,127.1	2,052.9	713.9	2,673.2	2,074.8		9,930.4	31,572.3	53,149.6
06	6,652.8	1,553.6	963.7	550.4	1,406.4	7.6	7,346.8	18,481.3	31,153.6
08	5,972.5	1,121.4	563.1	2,496.9	1,790.5		7,222.1	19,166.5	26,771.3
09	5,350.4	1,539.7	1,846.8	587.5	1,193.3	3.0	5,381.7	15,902.4	22,568.5
10	331.0	123.6	113.0	.4	109.0	1,919.8	200.9	2,797.7	3,532.6
SERVICEWIDE	52,017.1	11,278.5	5,567.4	9,395.8	10,002.1	1,930.4	48,672.5	138,863.8	218,494.3

1/ Recreation use of National Forest land and water which aggregates 12 person-hours. May entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittant.

TABLE C-5

NATIONAL FOREST RECREATION
REGIONAL SUMMARY OF RECREATION USE
PART 2 - SUMMARY OF ACTIVITIES
FISCAL YEAR 1978
THOUSANDS OF VISITOR-DAYS OF RECREATION

REGION	CAMPING	PICNICKING	REC.TRAVEL (MECHANIZED)	BOATING	GAMES & TEAM SPORTS	WATERSKIING AND OTHER WATER SPORTS	SWIMMING AND SCUBA DIVING	WINTER SPORTS	FISHING	HUNTING
01	2,541.4	486.6	3,106.4	294.3	34.7	44.3	138.6	542.9	965.9	1,129.4
02	6,359.9	942.1	7,187.5	247.7	39.2	19.5	100.9	3,771.5	1,893.8	1,323.3
03	5,168.0	1,343.5	3,678.1	474.6	129.8	63.1	286.1	414.6	1,064.7	1,066.9
04	7,222.4	1,225.5	5,436.2	527.4	131.3	54.5	230.0	797.1	2,229.6	1,464.4
05	14,519.9	1,417.1	14,086.9	1,291.8	287.1	332.5	1,627.6	3,060.3	2,958.0	1,416.2
06	9,197.1	1,133.5	5,766.4	889.8	75.7	89.6	405.4	2,014.1	2,016.4	2,116.8
08	5,581.2	1,572.5	5,855.3	1,191.0	70.1	260.1	1,091.4	9.9	2,906.8	3,775.0
09	5,093.6	585.6	5,491.6	1,349.2	47.6	118.4	547.7	916.7	2,145.0	2,507.8
10	362.4	56.4	361.8	1,381.7	9.9	1.0	14.1	106.6	378.9	146.4
SERVICE WIDE	56,045.9	8,762.8	50,970.2	7,647.5	825.4	983.0	4,441.8	11,633.7	16,559.1	14,946.2

1/ Recreation use of National Forest land and water which aggregates 12 person-hours. May entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittant.

TABLE C-5 (contd)

NATIONAL FOREST RECREATION
REGIONAL SUMMARY OF RECREATION USE
PART 2 Cont. - SUMMARY OF ACTIVITIES F.Y. 1978
THOUSANDS OF VISITOR-DAYS OF RECREATION

HIKING & MOUNTAIN CLIMBING	HORSEBACK RIDING	RESORT USE	ORG. CAMP USE	REC. RES. USE	GATHERING FOREST PRODUCTS	NATURE STUDY	VIEWING SCENES, SPORTS ENVIRONMENT	VIS. (EXHIBITS) TALKS, ETC	TOTAL USE	PERCENT OF TOTAL
514.0	313.1	136.9	105.2	316.3	212.3	59.2	257.0	365.5	11,564.0	5.3
1,693.6	493.8	575.9	272.3	508.0	282.0	185.7	1,165.3	301.1	27,363.1	12.5
1,032.7	388.3	255.2	336.9	540.5	535.2	132.3	604.3	557.7	18,072.5	8.3
995.2	512.7	541.3	423.9	611.6	405.5	95.2	864.7	550.6	24,319.1	11.1
2,229.4	430.9	1,349.8	1,779.8	3,165.3	512.6	335.5	1,743.0	605.9	53,149.6	24.3
1,656.7	416.1	1,029.2	563.1	727.5	667.8	159.4	1,701.7	527.3	31,153.6	14.3
1,369.2	313.3	74.4	239.3	283.2	309.9	133.1	1,046.2	689.4	26,771.3	12.3
1,303.9	167.4	291.2	128.2	308.7	258.1	146.4	858.4	303.0	22,568.5	10.3
130.9	2.7	16.2	8.0	28.9	13.0	10.5	312.2	191.0	3,532.6	1.6
10,925.6	3,038.3	4,270.1	3,856.7	6,490.0	3,196.4	1,257.3	8,552.8	4,091.5	218,494.3	100.0

1/ Recreation use of National Forest land and water which aggregates 12 person-hours. May entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittant.

2. Wildlife and Fisheries

A major increase in funding from $13.9 million in FY 1977 to $26.7 million in FY 1978 added emphasis to the wildlife and fish habitat management program. Even with the increase, however, funds for this program are still 24 percent below the RPA recommended level. In FY 1978 accomplishment exceeded the RPA target and the funded target. There are several reasons for this.

More prescribed burning was done in several Regions because of favorable weather conditions. Region 8 especially had a large increase because emphasis was placed on coordination of prescribed burning for wildlife with prescribed burning for fuels management, fire control and for silvicultural purposes. Thus, the FY 1978 funded target, in relation to RPA, is a better measure of progress toward implementing the program then the FY 1978 accomplishment

Much of the increased funding ($11.9 million) was spent on activities that were identified in the cooperative plans developed by the Forest Service and State fish and wildlife agencies pursuant to the Sikes Act (P.L. 93-452).

In response to the President's environmental message and new laws and regulations, we anticipate an expanding endangered and threatened species program and nongame wildlife program in the next several years. Analysis of anadromous fish fabitat improvement opportunities indicate high payoff and will receive increased emphasis.

Progress has been made toward providing habitat diversity through development of guidelines to protect habitat for cavity-dependent species such as woodpeckers and for old-growth, forest-dependent species such as spotted owl. Work has begun at the Regional level to develop habitat for species diversity as part of the overall program.

The harvest of big game animals from the National Forests is shown in table C-8 on page 161. This represents only about 5 to 10 percent of the populations, which is well below the harvestable surplus.

The Cost of the wildlife and fish habitat program on National Forests is believed to be more than offset by the benefits, although these are difficult to assess because most are nonmarket values. To get a rough idea of wildlife and fish habitat values, we can look at anadromous fish habitat, which is but a small part of the overall program. It is estimated that the National Forests annually produce a catch of 28 million salmon, weighing 118 million pounds, and valued at $100 million. This is the value to the commercial and sport fisheries, assuming that all fish fish were sold at the boat dock to a commercial processor.

A significant number of people enjoy fish and wildlife, as evidenced by the 16,559,000 visitor days of fishing and 14,946,000 visitor days in FY 1978. In addition, several million visitor days of nonconsumptive use of wildlife--photography, nature study, and just plain viewing--were enjoyed.

TABLE C-6

Estimated Legal Harvest of Principal Big-Game Animals[1] in National Forest, National Grasslands, and Land Utilization Projects

Fiscal Year 1978

State	Deer	Elk	Bear	Ante-lope	Moose	Turkey[2]
Alabama	1,810	0	0	0	0	540
Alaska	4,562	38	491	0	217	0
Arizona	7,352	1,335	218	142	0	1,177
Arkansas	3,451	0	4	0	0	2,706
California	19,056	0	386	114	0	78
Colorado	31,331	23,182	586	455	0	410
Florida	890	0	17	0	0	42
Georgia	3,130	0	7	0	0	143
Idaho	27,303	5,395	1,556	701	200	31
Illinois	2,542	0	0	0	0	80
Indiana	380	0	0	0	0	18
Kansas	2	0	0	0	0	15
Kentucky	537	0	0	0	0	1
Louisiana	1,490	0	0	0	0	606
Maine	90	0	7	0	0	0
Michigan	15,420	0	477	0	0	125
Minnesota	9,753	0	215	0	0	0
Mississippi	3,290	0	0	0	0	813
Missouri	1,213	0	0	0	0	2,624
Montana	19,611	10,016	1,513	205	411	195
Nebraska	240	0	0	295	0	150
Nevada	5,161	8	1	16	0	0
New Hampshire	919	0	148	0	0	0
New Mexico	8,979	726	167	161	0	1,060
New York	120	0	0	0	0	2
North Carolina	2,469	0	97	0	0	31
North Dakota	2,747	0	0	267	0	98
Ohio	768	0	0	0	0	25
Oklahoma	381	0	0	0	0	183
Oregon	53,295	12,849	862	215	0	40
Pennsylvania	10,600	0	0	0	0	840
South Carolina	8,900	0	0	0	0	687
South Dakota	6,360	40	0	641	0	930
Tennessee	880	0	12	0	0	45
Texas	1,232	0	0	0	0	0
Utah	43,211	2,618	32	47	51	10
Vermont	540	0	15	0	0	9
Virginia	10,430	0	119	0	0	2,400
Washington	21,318	6,044	1,291	0	3	2
West Virginia	5,362	0	57	0	0	1,279
Wisconsin	4,750	0	236	0	0	0
Wyoming	17,460	17,425	274	6,860	1,371	625
Total	359,000	80,000	8,800	10,000	2,250	18,000

[1]Legal harvest of other big-game animals for all lands administered by the Forest Service includes mountain goats, bighorn sheep, Dall sheep, and wild boar.

[2]Turkey are classed as a big-game species for this report.

NOTE--Total figures are rounded-off.

3. Range Management

a. Grazing Program

In FY 1978, production of livestock grazing on the National Forest System System reached 11.8 million animal unit months (AUM's), essentially at the funded goal of 11.9 million AUM's. The original RPA target at full financing was 12.1 to 12.9 million AUM's. Authorized livestock grazing level in 1978 was 9.9 million AUM's or 1.9 million AUM's below the National Forest System production of 11.8 million AUM's. Actual permitted use reached 9.0 million AUM's (see Table C-10).

Although total current production exceedes permitted grazing, overstocking and understocking exists in some areas. The RPA Program provides for adjusting stocking levels in accord with maintaining or improving land productivity and relative cost effectiveness.

To reach the RPA cost-effective goals in livestock grazing, project investinvestments are being examined for relative benefits using economic, environmental, and social criteria. Investments selected in FY-78 were in a large part a product of where range betterment funds were generated. Under the Federal Land Policy and Management Act (P.L. 94-579), 50 percent of monies received from grazing on National Forests in the 11 western States comprise the range betterment fund, and these monies are used to finance range investments in these areas. Financing at the 1978 level provided only limited opportunity to shift livestock grazing along the lines contemplated in the RPA program.

b. Low Ecological Condition Rangeland Treatment

Land treatments and managfement adjustments to improve low-ecological condition rangelands present in the National Forest System exceeded the RPA targeted goal of 335,000 acres in Fiscal Year 1978. Actions taken by the Forest Service, cooperating permittees, and others, resulted in the initial treatment of 564,600 acres. Treatments are planned to raise the ecological conditions and productivity of the rangeland for continued benefits of livestock grazing, wildlife production, watershed production, and recreation use.

c. Range Evaluation and Testing

To test the validity of assumptions made in selecting the RPA range program, three major evaluation and testing projects were called for in the RPA program. The first evaluation and testing project was established and funded in Oregon in 1976. In FY 1978, additional areas were selected in the Intermountain West and in the Southern United States. Each of these areas involves several States. Cooperative assistance was received from other Federal as well as State agencies.

In the Oregon project, 11 coordinated resource plans have been completed with 10 additional plans programmed through 1980. These plans provide for installation of structural and non-structural improvements and adjustments in livestock grazing management to test the RPA program assumption about rangeland production and output productions. Through FY 1978, about 2,200 acres have been treated to improve forage conditions. Also, 63 miles of fence have been built, and 173 water developments constructed.

d. Grazing Fees

Fees for the 1978 grazing season were frozen at the 1977 level as required by P.L. 95-321. Action by the 95th Congress resulted in legislation (P.L. 95-514) establishing a procedure to determine grazing fees. The new fee procedures will be implemented for the 1979 grazing fee year.

e. Improved Management

The number of range allotments decreased in 1978 to 10,957 from the 11,164 reported in 1977. This reduction reflects combining of allotments for more efficient use and administration of range resources and did not result in any significant change in acreage being grazed.

Improved management was maintained on 6,289 allotments. Improved management was started on 815 allotments. This brought the number of allotments on which improved management is now being carried out to 7,104, or 65 percent of the 10,957 allotments nationwide.

TABLE C-7

U.S. DEPT. OF AGRICULTURE - FOREST SERVICE
ANNUAL GRAZING STATISTICAL REPORT - FY 1978

NATIONAL FOREST SYSTEM
ALL REGIONS

	NO. OF PERMITTEES *	CATTLE NO.	CATTLE AUMS	HORSES & BURROS NO.	HORSES & BURROS AUMS	SHEEP & GOATS NO.	SHEEP & GOATS AUMS	TOTAL NO.	TOTAL AUMS
AUTHORIZED TO GRAZE		1,582,485	8,530,369	145,776	114,863	2,005,555	1,248,783	3,733,816	9,894,015
ACTUALLY GRAZED									
PAID PERMITS	15,518	1,339,037	7,863,357	17,431	53,197	1,181,626	938,356	2,538,094	8,954,910
FREE USE									
RECREATION STOCK	97,262			133,582	33,838			133,582	33,838
OTHER FREE USE	9,016	3,464	18,790	16,608	27,517	6,711	3,110	26,783	49,417
NON-NFS LANDS	258	49,816	269,547	366	3,624	29,106	23,985	79,288	297,156
CROSSING	118	35,829	6,955	277	48	93,977	7,931	130,083	14,934
UNAUTHORIZED USE	445	6,802	24,088	528	4,226	1,358	623	8,688	28,937
SUBTOTAL **	122,359	1,385,132	7,913,190	168,426	118,826	1,283,672	950,020	2,837,230	8,982,036
WILD HORSES				3,419	39,334			3,419	39,334
WILD BURROS				366	3,030			366	3,030
TOTAL ACT. GRAZED **	122,359	1,385,132	7,913,190	172,211	161,190	1,283,672	950,020	2,841,015	9,024,400
LOSSES									
POISONOUS PLANTS		1,601				3,317		4,918	
PREDATORS		914		6		21,457		22,377	
OTHER		5,889		79		10,127		16,095	

* PERMITTEES HOLDING PAID PERMITS ARE NOT COUNTED IN OTHER CATEGORIES
** NON-NFS LAND DATA NOT INCLUDED IN TOTALS

TABLE C-8

GRAZING USE--FISCAL YEAR 1978
NATIONAL FOREST SYSTEM
1000 Animal Unit Months

STATES	CATTLE	DOMESTIC HORSES	SHEEP	WILD HORSES	WILD BURROS	TOTAL
Alabama.....	7,005					7,005
Alaska.....						
Arizona.....	1,275,851	13,052	30,474	72	107	1,319,556
Arkansas.....	63,584	220				63,804
California.....	412,522	7,347	49,842	16,564	2,429	488,704
Colorado.....	820,558	16,167	186,669			1,023,394
Florida.....	26,722					26,722
Georgia.....	5,898	44				5,942
Idaho.....	571,891	11,736	204,314	59	10	788,010
Illinois.....	6,225	32	1,565			7,822
Indiana.....	475					475
Kansas.....	45,299	130				45,429
Kentucky.....						
Louisiana.....	50,686	1,804	3			52,493
Maine.....						
Michigan.....	366					366
Minnesota.....	147					147
Mississippi....	26,063	47	53			26,163
Missouri.....	27,928	11				27,939
Montana.....	570,336	13,381	21,867	29		605,613
Nebraska.....	130,298	58	455			130,811
Nevada.....	256,169	1,283	34,195	12,760	130	304,537
New Hampshire..						
New Mexico.....	801,370	9,191	18,128	5,674	354	834,717
New York.....	10,355					10,355
North Carolina.	273					273
North Dakota...	559,389	3,302	1,016			563,707
Ohio.....	9					9
Oklahoma.....	33,217	86				33,303
Oregon.....	501,545	3,980	33,727	3,312		542,564
Pennsylvania...						
South Carolina.	1,315	43				1,358
South Dakota...	475,997	1,167	9,147			486,311
Tennessee.....						
Texas.....	76,157	77				76,234
Utah.....	447,665	8,934	203,608	864		661,071
Vermont.....	131	12				143
Virginia.....	6,476	970	278			7,724
Washington.....	103,408	4,458	3,179			111,045
West Virginia..	7,544	66	579			8,189
Wisconsin.....	15	1				16
Wyoming.....	590,301	21,227	150,921			762,449
Caribbean.....						
TOTAL.....	7,913,190	118,826	950,020	39,334	3,030	9,024,400

TABLE C-9

RANGE ALLOTMENT MANAGEMENT
NATIONAL FOREST SYSTEM
FISCAL YEAR 1978

REGION	TOTAL ALLOTMENTS	ALLOTMENTS MAINTAINED TO IMPROVED MANAGEMENT STATUS	ALLOTMENTS ON WHICH IMPROVED MANAGEMENT WAS STARTED
1	2,192	879	62
2	2,706	2,223	136
3	1,624	970	138
4	1,959	974	107
5	808	534	106
6	898	440	139
8	584	168	91
9	186	101	36
10	0	0	0
TOTAL	10,957	6,289	815

4. Timber Management

a. Timber Sale Offerings

Although the projected RPA program level was not funded during FY 1978, a revised and increased timber sale offering program of 12.2 billion board feet was accomplished as planned. A total of 11.0 billion board feet were actually sold at a value of $1,328 million, while 10.1 billion board feet were harvested at a value of $855 million. Appeals and court actions challenging land use and timber plans, and planned timber sale offerings continue to be major costly barriers to target accomplishment. Significant delays in the on going RARE II process would result in a reduction of timber sale offerings in future years.

Interdisciplinary reviews, improved silvicultural practices, water monitoring, advance logging systems, and closer contract administration continued to improve the environmental quality of the timber sales program during FY 1978. At the same time, the per unit value of volume sold increased 21 percent from FY 1977.

b. Silvicultural Examination

In fiscal year 1978, 6,675,000 acres of land were examined and prescription-prepared for future timber projects. The objective was to get site specific prescriptions for all lands needing treatments.

As a minimum, each stand will be examined and prescription revised on a 10-year cycle, to keep pace with changing conditions and management needs. Silvicultural examinations also provide inventory data used in the land management planning process.

In addition, considerable effort was expended in developing proposed planning regulations to implement the National Forest Management Act of 1976. Regulations were proposed (Draft in Federal Register) covering departures from non-declining even-flow, intensive forest management, silvicultural guidelines, and guides for determining allowable sale quantities and long term sustained yield capacity.

c. Reforestation and Timber Stand Improvement

Reforestation was completed on 411,000 acres of the 460,000 acres funded. Timber Stand Improvement was completed on 420,000 acres of the 467,000 acres funded in FY 1978. The restricted use of herbicides for these activities and severe inflation of contracting costs resulted in the shortfall. Court actions in opposition to herbicide use were initiated in Arkansas, California, Oregon, and Washington, resulting in delays and substitutions to more costly treatment methods. If herbicide use continues to be restricted or curtailed, a re-evaluation of reforestation and timber stand improvement activities will be required from an economic, silvicultural, and environmental standpoint.

Contracting costs for site preparation, planting, thinning and release have increased more than 50 percent in some areas during FY 1978. When 90 percent of the reforestation and timber stand improvement job is done through contracting, these increased costs become significant. A Regional breakdown of the reasons for not meeting Reforestation and Timber Stand Improvement Targets follows.

TABLE C-10

NUMBER OF SALES, VOLUME AND VALUE OF TIMBER SOLD AND HARVESTED
ON NATIONAL FOREST LAND BY STATES

FISCAL YEAR 1978

States	Timber Sold			Timber Harvested	
	No. Sales*	Volume-MBF	Value-$	Volume-MBF	Value-$
Alabama.....	164	72,413	$ 4,845,154	50,690	$ 2,089,173
Alaska.....	78	159,161	5,582,734	457,795	2,014,017
Arizona.....	6,796	268,262	24,428,603	259,670	16,873,969
Arkansas.....	573	175,911	11,285,490	201,607	8,425,395
California.....	10,777	1,961,008	278,248,861	1,806,841	179,950,403
Colorado.....	1,597	135,581	3,174,570	118,317	1,657,201
Florida.....	111	84,873	3,438,287	64,698	2,519,050
Georgia.....	247	43,392	2,699,161	49,631	2,216,140
Idaho.....	3,229	830,540	42,645,379	772,730	34,323,105
Illinois.....	38	11,663	221,193	4,245	57,688
Indiana.....	49	6,454	273,012	2,779	87,693
Kentucky.....	165	21,159	424,375	15,569	359,669
Louisiana.....	374	157,682	13,550,578	161,416	9,757,908
Maine.....	2	2,155	45,580	1,371	23,912
Michigan.....	423	176,111	2,580,133	156,507	1,557,582
Minnesota.....	250	113,706	1,108,332	119,190	947,195
Mississippi....	430	207,145	17,391,122	225,160	15,689,067
Missouri.....	570	55,078	1,772,693	41,384	1,090,620
Montana.....	2,131	481,642	31,525,248	445,179	23,516,325
Nevada.....	212	1,357	4,895	382	2,793
New Hampshire..	47	35,405	791,168	24,072	318,785
New Mexico.....	9,837	118,164	7,336,640	120,698	6,920,991
New York LUP...	29	88	432	97	470
North Carolina.	353	47,597	1,248,294	27,539	936,604
Ohio.....	32	10,302	316,596	3,728	124,043
Oklahoma.....	88	36,523	2,211,556	21,672	548,093
Oregon.....	7,438	3,470,506	665,714,195	3,148,150	403,011,997
Pennsylvania...	80	48,918	2,830,130	26,813	1,594,848
South Carolina.	184	128,662	8,836,535	98,392	5,430,354
South Dakota...	104	149,911	3,736,486	103,896	2,501,159
Tennessee.....	124	18,975	327,317	27,716	482,670
Texas.....	287	64,236	6,183,850	63,501	4,078,806
Utah.....	1,872	42,512	1,722,157	56,951	1,343,239
Vermont.....	99	12,530	282,063	4,710	145,914
Virginia.....	927	47,875	409,802	24,129	256,943
Washington.....	3,147	1,513,877	174,975,421	1,184,427	120,185,873
West Virginia..	167	28,352	553,760	9,955	220,059
Wisconsin.....	194	117,834	1,755,141	85,819	1,071,719
Wyoming.....	1,139	138,282	3,937,966	92,090	2,350,027
Puerto Rico....	9	9	778	8	701
Grand Totals	54,373	10,995,851	$1,328,415,687	10,079,524	$854,682,200

* Excludes non-convertible sales

TABLE C-11

REFORESTATION AND TIMBER STAND IMPROVEMENT
SUMMARY BY REGION
FISCAL YEAR 1978

	Reforestation Appropriated		KV	
Region	Target	Accomplishment	Target	Accomplishment
1	21,567	22,263	27,637	22,552
2	16,206	11,570	4,141	3,570
3	7,822	5,971	3,723	6,164
4	9,869	10,220	10,491	11,574
5	18,330	18,402	21,940	14,358
6	37,860	37,013	101,842	85,160
8	64,347	59,037	62,618	50,888
9	29,999	34,420	20,935	17,839
10	----	----	1,125	249
Total	206,000	198,896	254,452	212,354

TIMBER STAND IMPROVEMENT

	Appropriated		KV	
Region	Target	Accomplishment	Target	Accomplishment
1	20,134	16,737	14,868	8,787
2	18,168	16,600	13,900	14,140
3	31,674	38,909	35,917	50,708
4	11,855	12,083	10,997	9,929
5	28,055	16,556	28,970	16,298
6	60,129	43,820	47,127	39,338
8	75,327	61,918	14,998	10,434
9	41,658	49,617	10,701	12,141
10	----	----	2,700	2,399
Total	287,000	256,240	180,128	164,174

TABLE C-12

FOREST SERVICE NURSERY PRODUCTION (thousand trees)

Region	Nursery	FY 1978 Sold to Nursery region	Other regions	Other agencies	Surplus destroyed	Total production
1	Coeur d'Alene	5,380.5	4,180.5	288.1	54.0	9,903.2
2	Bessey	---	---	2,709.0	0	2,709.0
	Mt. Sopris	2,039.0	46.0	1.0	81.0	2,167.0
	Subtotal	2,039.0	46.0	2,710.0	81.0	4,876.0
4	Lucky Peak	5,058.0	5,713.6	212.6	775.4	11,759.9
5	Placerville	6,736.0	---	1,221.0	249.0	8,206.0
	Humboldt	5,499.0	3,545.0	2,732.0	486.0	12,262.0
	Subtotal	12,235.0	3,545.0	3,953.0	735.0	20,468.0
6	Bend	9,952.0	---	534.0	736.0	11,222.0
	Wind River	28,520.0	---	5,120.0	1,922.0	35,562.0
	Subtotal	38,472.0	---	5,654.0	2,658.0	46,784.0
8	Ashe	18,311.0	0	0	0	18,311.0
	Caribbean	60.0	0	0	0	60.0
	Subtotal	18,371.0	0	0	0	18,371.0
9	Eveleth	3,714.0	0	0	0	3,714.0
	Toumey	3,972.0	0	0	0	3,972.0
	Subtotal	7,686.0	0	0	0	7,686.0
GRAND TOTAL		89,241.8	13,485.2	12,817.7	4,303.4	119,848.1

TABLE C-13

CONTAINERIZED NURSERY STOCK PRODUCTION
(Thousand plantable trees)

FY 1978

Region	Facility	Number seeded	Plantable seedlings produced	FY 1978 Disposition: National Forests	FY 1978 Disposition: Sold	Produced for 1979
1	Coeur d'Alene	2,094.8	1,904.4	1,755.+	0	0
2	Mt. Sopris	1,484.0	1,323.0	1,323.0	0	0
3	Albuquerque	1,391.0	1,162.7	645.8	0	516.9
5	Placerville	36.0	31.7	30.2	0	0
6	Beaver Creek	1,706.0	1,400.0	1,400.0	---	---
8	(2 locations)	740.0	704.0	704.0	0	---
9	(6 locations)	148.1	142.8	179.0 1/	0	1.1
10	Petersburg	10.0	8.0	8.0	---	---
	TOTAL	7,609.9	6,676.6	6,045.4	0	518.0

1/ 37 M seeded in FY 77

TABLE C-14

SEED EXTRACTORY PRODUCTION
(Pounds of clean seed)
FY 1978

Region	Location	Seed origin: Seed orchard and selected trees	Seed origin: Seed production areas and seed stands	Seed origin: Other area	Total
1	Coeur d'Alene	57.2	---	187.5	244.7
2	Bessey	---	5,911.0	---	5,911.0
	Mt. Sopris	---	577.0	---	577.0
3	Santa Fe	---	---	9,179.0	9,179.0
4	Lucky Peak	---	---	804.0	804.0
5	Klamath	---	---	28.3	28.3
	Placerville	13.5	---	4,624.5	4,638.0
6	Wind River	38.3	78.7	1,813.0	1,930.0
8	Ashe	1,435.0	417.0	11,443.0	13,295.0
	Stuart	767.0	---	5,000.0	5,767.0
9	Various locations	14.0	1,582.0	1,191.0	2,787.0
10	Petersburg	---	---	5.0	5.0
	GRAND TOTAL	2,325.0	8,565.7	34,275.3	45,166.0

TABLE C-15

OTHER PLANTING STOCK AND SEED ACQUISITION
FY 1978

Region	Planting Stock (thousand trees)					Clean Seed (Pounds)				
	Service contract	Other regions	Other agencies	Commercial sources	Total	Service contract	Other regions	Other agencies	Commercial sources	Total
1	67.0	---	---	---	67.0	---	---	---	---	---
2	849.0	---	---	---	849.0	---	---	---	30	30
3	---	4,378.0	---	---	4,378.0	---	---	---	---	---
4	---	456.4	---	---	456.4	---	---	---	---	---
5	---	---	---	1.5	1.5	---	602	---	---	602
6	3,236.2	3,946.0	4,161.6	1,037.2	12,381.0	---	---	---	---	---
8	1,250.0	---	3,859.5	266.0	5,375.5	300	---	---	189	489
9	---	---	1,622.0	200.0	1,822.0	---	2,000	---	3	2,003
10	---	---	68.0	---	68.0	---	---	---	---	---
TOTAL	5,402.2	8,780.4	9,711.1	1,504.7	25,398.4	300	2,602	0	222	3,124

1/ Not Working Capital Fund (Tree Improvement Seed)

5. Watershed Management

Soil and water resource improvement on 88 thousand acres equaled funded targets for FY 1978. This includes the selective improvement of soil productivity and water supply where commensurate with benefits. Available information indicates that 370 million acre feet of water produced on the National Forests (about 95 percent of the current estimated yield) meets minimum water quality standards. Good progress has been made towards achieving the national water quality goals of swimmable and fishable waters by 1985. However, the rate of accomplishment under current levels of funding will not be sufficient to bring all water produced up to minimum water quality standards established by the individual States until the year 2000.

6. Minerals Area Management

The program for fiscal year 1978 was accomplished as planned. A total of 14,500 operating plans for leasable, locatable, reserved, and and common variety minerals was developed and administered.

Recent minerals area management accomplishments include completing comprehensive environmental statements, covering the following:

(1) Geothermal leasing and developments in and around the Breitenbush Known Resource Area, and Willamette and Mt. Hood National Forests, Oregon.

(2) Mining and reclamation plan for a major copper-silver project in the Kootenai National Forest, Montana.

(3) Mining and reclamation plan for a major new uranium mine and mill in the Gunnison National Forest, Colorado.

The Forest Service cooperated with the U. S. Department of the Interior in the preparation of:

(1) A draft supplement to a final environmental statement on proposed phosphate leasing, Osceola National Forest, Florida.

(2) Three regional draft environmental statements on proposed coal leasing, covering parts of the Manti-LaSal and Fishlake National Forests, Utah; the Thunder Basin National Grasslands, Wyoming; and the Grand Mesa, White River, and Gunnison National Forests, Colorado.

Coordination was completed, and consent given to lease over 17 million tons of coal to be extracted by underground methods Manti-LaSal and Fishlake National Forests, Utah.

A memorandum of understanding was signed with the Geological Survey concerning joint Forest Service-Geological Survey surface management of geothermal lease operations on National Forest System lands.

The Forest Service coordinated drilling operations in, and adjacent to, the Little Missouri National Grasslands, North Dakota, leading to nine new pool discoveries. Potential recoverable reserves are 40 to 75 million barrels of oil, and 10 to 40 billion cubic feet of natural gas.

From the standpoint of future trends, increased energy activity is occuring in:

Oil, gas, uranium	All geographic regions
Coal	Colorado, Utah, Wyoming
Geothermal	All western regions.

Operating plans for minerals activities related to National Forest System lands are expected to increse to 15,000 for 1979, 17,000 for 1980, and 20,000 for 1981, requiring a proportionate increase in funding. There will be a continued high degree of concern to insure that minerals are developed in a manner consistent with sound land management objectives. In some cases, mitigations to be applied following mining are expected to make some marginal operations uneconomical.

7. Protection

The Forest Fire Management Program provides for protection of 187 million acres of National Forest System lands. In addition, assistance is provided to State and private landowners in protecting 20 million acres of their lands.

In 1978, the Forest Service revised its policy relating to fire management. The revised policy is to provide well planned and executed fire protection and fire use programs that are cost-effective and responsive to land and resource management goals and objectives. The new policy is designed to directly support the 1974 Forest and Rangeland Renewable Resources Planning Act resources output. The full implementation of the new policy will take approximately 5 years and is contingent upon the completion of forest land management plans. When the new policy is fully operational, the impact of fire or fire prevention will be addressed in terms of fire effect on resource goals and objectives rather than the traditional number fires and acres burned.

a. Calendar Year 1978 Fire Season

In 1978, the central and Southern Rocky Mountains continued to experience drought conditions with fire numbers comparable to the high 1977 numbers. A dry fall in the southeastern part of the United States also brought this area's fire total to the corresponding 1977 total. Other areas of the country experienced a reduction in number of fires. This reduction varied from 50% in the Northern States of Montana and Idaho to 11 percent in the State of California. Nationwide there was an average decrease of 28 percent in fire numbers. The total acreage burned, which was under National Forest Protection, was 74,000 acres. This is about one-third of the previous 5-year average of 201,532 acres.

The more normal major fire season for most of the Western United States wildlands occurred in July and August. The hardest hit States were Idaho, Utah, California, Oregon, and Colorado. During these 2 months, 2/3 of the major fire workload occurred. October saw the 1978 fire season culminate in the western United States with Santa Anna winds in Southern California. These winds fanned numerous small fires into major blazes, burning 186 homes and over 40,000 acres of land.

b. Progress in Reducing Fire Related Deaths in 1978

The year 1978 was a significant year in the reduction of fire related deaths. There were no aviation or fireline fatalities however, in California three firefighters were killed in a vehicle accident on their way to a fire. This record is a result of increased standards and increased expenditures over the last decade. These include:

1. During the late 1960's, an increase of 8 hours (from 16 to 24) of annual required training for regular and seasonal employees. In 1973, this was increased to 32 hours.

2. During the 1970 through 1973 period, use of fire-resistant clothing and fire shelters became more common.

3. During the 1974 through 1977 period, basic firefighting training standards were increased to 40 hours. Agreement among all Federal wildland agencies to adopt and comply with the National Interagency Fire Qualification System for all employees, including casuals, further increased training standards. Also, during this period, standardized training materials were developed and distributed. Use of fire-resistant clothing and fire shelters became mandatory. The "step test" was formally adopted as a safety and productivity measure.

These increased standards resulted in a three-fold increase of safety and training costs.

c. Benefits Resulting from Fires

In response to the Appropriation Subcommittee's directive, a process has been developed to make cost/benefit analyses of fire management budget alternatives. Test forests are assisting in the application of the process. The evaluation will be completed by mid-February, 1979.

d. Fire Management Areas

In order to achieve land management goals and objectives, variable factors affecting the land must be considered. Fire is one of the major factors. As planning is completed, parcels of land are delineated as to common fire management objectives. Our goal is to develop fire management objectives, by 1983, for all National Forest areas through the land management planning process.

Fire management areas allow for variable protection objectives. Land management objectives may be met by varying the protection objectives. Whenever a fire is burning outside the prescription for the area, suppression action will be taken. At all times, a fire will be managed to meet land management objectives, or if it is not meeting those objectives, it will receive suppression action that is fast, energetic, thorough, and conducted with a high degree of regard for personnel safety.

Forest Supervisors shall determine objectives that include: (1) the standard of fire protection and fire use necessary to ensure that land management goals and objectives can be met, (2) measurable standards, such as, the maximum individual fire size, and tolerable annual and long-term allowable burned acreage, for established fire intensity levels, and (3) as appropriate, areas for treatment by prescription fire and a schedule for the required maintenance of these areas.

e. Fuels Management

Fuels management received increased emphasis during this fiscal year and fuel reduction exceeded the RPA high goal of 391,000 acres. Fuel reduction was accomplished on 392,000 acres using fire management funds. Fuel reduction benefits were also obtained on more than 1 million acres of fuels from land treatment activities such as timber sales, timber stand improvement, road construction, wildlife habitat, and range improvement projects. In addition, approximately 1/2 million acres of naturally occurring fuels were treated for other purposes. In total, more than 1-3/4 million acres of fuel reduction were accomplished. Assisting in this accomplishment were the many Human Resource programs.

f. Fire Prevention

Fire prevention continued to receive increased emphasis in FY 1978. The reduction in person-caused fires to 5,217 was significantly better than the high RPA level of 6,209. The level of person-caused fires in FY 1978 was also significantly below the 7,358 experienced in FY 1977, which was a severe drought year.

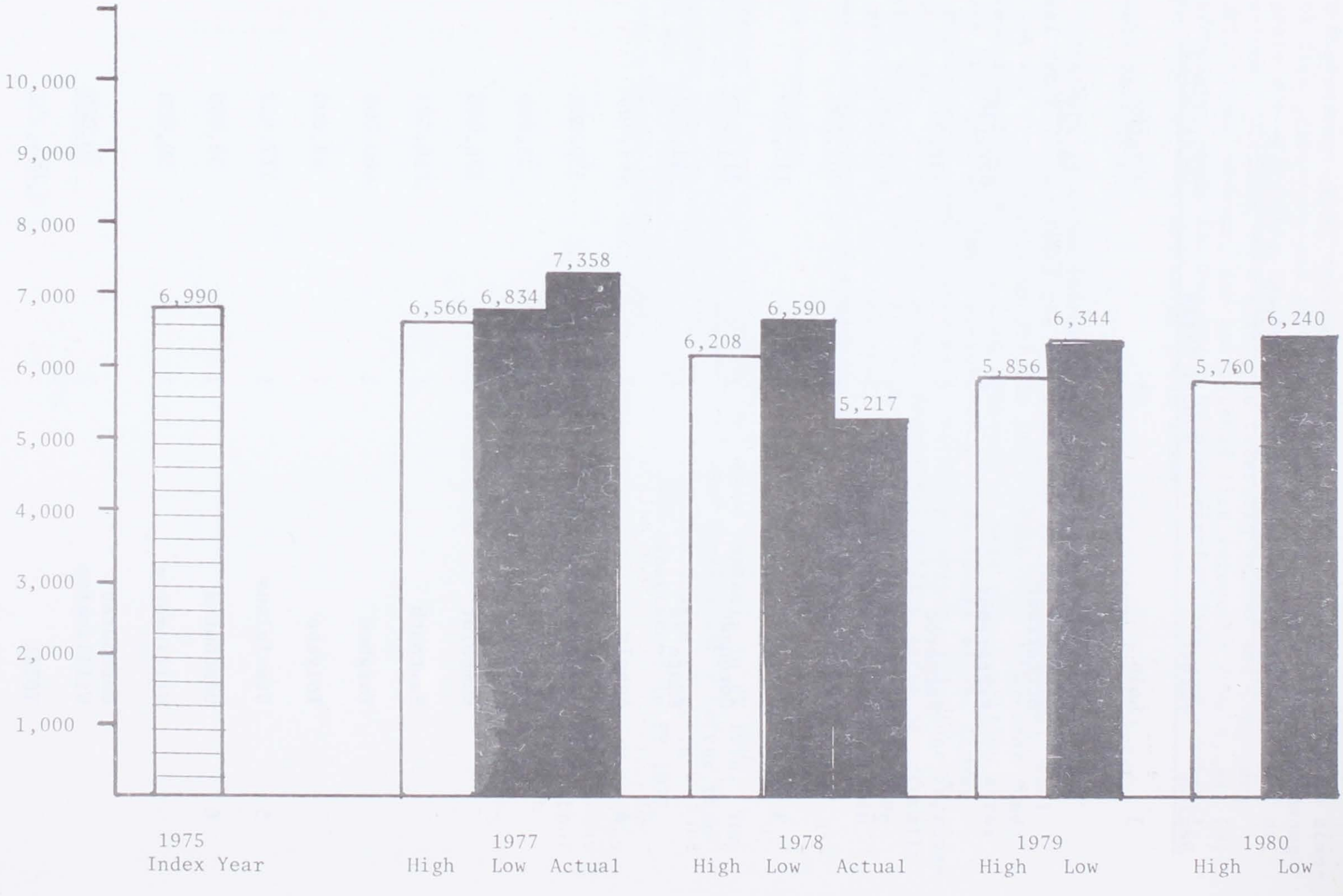
TABLE C-16

FIRE MANAGEMENT AREAS IMPLEMENTED IN FY 1978

Region	Forest	Number Areas	Total Acres
1	Lolo	35	309,786
	Deerlodge Beaverhead Bitterroot	1	48,520
	Bitterroot	4	859,738
	Nezperce	1	557,000
2	Black Hills	2	427,000
	San Juan	7	305,000
3	Gila	1	115,950
	Coronado	2	211,600
	Santa Fe	1	41,132
4	Ashely	3	162,700
	Bridger-Teton	1	550,000
	Dixie	1	25,000
	Humboldt	1	226,000
	Sawtooth	1	216,383
	Targhee	2	460,000
	Toiyabe	1	48,000
5	Stanislaus	1	112,422
6	Deschutes	1	58,000
	Williamette	1	20,000
	Deschutes Williamette	1	50,000
	TOTAL		4,804,231

FIGURE C-1

FIRE PREVENTION



8. Land Management

a. Land-Line Location

The funded target for FY 1978 was 8,141 miles of land-line location. Accomplishment was 5,344 miles. Accomplishment was an increase over FY 1977 (3,219 miles), but fell short of the funded target primarily because of two reasons: (1) cadastral surveyors could not be recruited and trained to be fully productive in one year's time; and (2) the cost per mile of surveying and posting to Forest Service standards exceeded the budget estimates, which were based on limited experience with the full-standard job. Much of the effort in previous years was with corner search and monumentation.

A yearly program of approximately 6,000 miles will be needed to meet RPA research outputs, and the prevention or resolution of trespass and title claims.

b. Land Acquired and Exchanged

There was a shortfall in accomplishment of the objectives for land and exchange. Accomplishment of purchase is in acres acquired. All funds appropriated for Weeks Law purchases were obligated, but title to the land had not passed to the United States by the end of FY 1978. Several key properties being purchased with Land and Water Conservation Fund monies were delayed due to extended negotiations.

Land exchanges have been delayed to complete cultural resource inventories and environmental assessments or statements, and inability to reach agreement with the landowners involved. Although there was no funded target for land donation, 29,963 acres of land were acquired by acceptance of title to lands from 14 landowners.

TABLE C-17

LAND LINE LOCATION

SUMMARY BY REGION

Fiscal Year 1978
(Units in Miles)

Region	Target	Accomplishment
1	887	363
2	668	188
3	403	489
4	1,553	207
5	158	425
6	322	821
8	3,902	2,541
9	216	346
10	32	27
TOTAL	8,141	5,407

TABLE C-18

NATIONAL FOREST SYSTEM LANDS ADMINISTERED BY THE FOREST SERVICE AS OF SEPTEMBER 30, 1978

State and Commonwealth	Natl. For., Purchase Units Research Areas & Other Areas	National Grasslands	Land Utilization Project	Total
Alabama	642,820	---	---	642,820
Alaska	20,594,144	---	---	20,594,144
Arizona	11,270,325	---	---	11,270,325
Arkansas	2,469,314	---	---	2,469,314
California	20,340,137	---	19,225	20,359,362
Colorado	13,776,206	612,145	560	14,388,911
Connecticut (Forest Insect and Disease Lab)	10	---	---	10
Florida	1,083,479	---	---	1,083,479
Georgia	849,306	---	9,340	858,646
Idaho	20,362,978	47,659	---	20,410,637
Illinois	257,815	---	---	257,815
Indiana	182,534	---	324	182,858
Kansas	---	107,700	---	107,700
Kentucky	662,387	---	---	662,387
Louisiana	597,032	---	---	597,032
Maine	50,977	---	465	51,442
Michigan	2,712,676	---	999	2,713,675
Minnesota	2,794,407	---	---	2,794,467
Mississippi	1,139,689	---	---	1,139,689
Missouri	1,444,119	---	13,105	1,457,224
Montana	16,768,524	---	---	16,768,524

TABLE C-18 (Continued)

State and Commonwealth	Natl. For., Purchase Units Research Areas and Other Areas	National Grasslands	Land Utilization Project	Total
Nebraska	257,165	94,334	---	351,499
Nevada	5,143,270	---	---	5,143,270
New Hampshire	683,193	---	---	683,193
New Mexico	9,108,057	136,412	240	9,244,709
New York	---	---	13,232	13,232
North Carolina	1,155,568	---	---	1,155,568
North Dakota	796	1,104,789	---	1,105,585
Ohio	170,421	---	---	170,421
Oklahoma	245,026	46,300	---	291,326
Oregon	15,498,296	106,138	856	15,605,290
Pennsylvania	508,586	---	---	508,586
Puerto Rico	27,846	---	---	27,846
South Carolina	607,568	---	---	607,568
South Dakota	1,132,018	863,059	---	1,995,077
Tennessee	621,110	---	---	621,110
Texas	664,049	117,552	---	781,601
Utah	8,045,869	---	---	8,045,869
Vermont	266,012	---	---	266,012
Virginia	1,609,784	---	---	1,609,784
Virgin Islands (Estate Thomas Experimental Forest)	147	---	---	147
Washington	9,068,984	---	725	9,096,709
West Virginia	963,345	---	---	963,345
Wisconsin	1,494,960	---	160	1,495,120
Wyoming	8,679,970	572,259	---	9,252,329

TABLE C-19

LAND ACQUISITION

Purchase 1/			Exchange 2/			Donation 1/			Special Studies 3/		
Acres	Cases	Value	Acres	Cases	Value	Acres	Cases	Value	Acres	Cases	Value
40,011	363	$29,441,241	52,289	137	$27,105,255	29,963	14	$10,256,008	458,690	22	$250,000,000

1/ Acres acquired.
2/ Acres offered - approved.
3/ Made for land transfers, interchanges, boundary modifications.

9. Facilities (Roads) Management

Major accomplishments in FY 1978 were:

1. Maintained approximately 220,000 miles of roads.

2. Awarded timber sale contracts that included the construction of 9,118 miles of road and 101 bridges.

3. Awarded public works contracts for the construction of 641 miles of roads as a result of small business opting for the Forest Service to construct roads specified in timber sale contracts.

4. Awarded public works contracts for the construction of 793 miles of road and 108 bridges that will benefit timber and other natural resources in years beyond FY 1978.

5. Provided sufficient road locations, surveys, and designs to continue a timber sales program at the FY 1978 level.

Appropriated road construction exceeded funded targets because receipts in FY 1977 exceeded estimated receipts, and this increased the 10 percent road construction fund by approximately $9.9 million. Estimates provided in the budget process 18 to 24 months in advance are not firm. Also, competitive bidding (and the variables associated with it) resulted in individual project cost savings.

Purchaser constructed miles are less than the funded target for the same reasons as above plus the fact that many small business concerns turned roads back to the Forest Service for construction in the last quarter of the fiscal year. The additional time required to advertise and award public works contracts for this work cause some projects to carry forward for award in the next fiscal year.

Funding at the FY 1978 level for the road construction program will be sufficient to support the recommended RPA resource programs. However, the method of funding identified in the RPA program--public works construction versus purchaser construction--will not be met. The approximate ratio in RPA is 30 percent public works construction to 70 percent purchaser construction in miles.

The type and location of roads being constructed in the Forest Service today are reaching an adequate balance between environmental concerns and economic realities.

Environmental degradation and road overbuilding continue to be an important consideration in the construction program. Progress in these areas is evidenced by fewer complaints from the public and industry. Emphasis will continue on this aspect of the program.

TABLE C-20

ROADS AND BRIDGES

State or Commonwealth	Construction & Reconstruction From Appropriated Funds			Construction & Reconstruction By Timber Purchasers		
	Road Miles	Bridges Number	M$ Dollars	Road Miles	Bridges Number	M$ Dollars
Alabama	2	3	687	16	-	332
Alaska	10	19	10,463	43	78	3,477
Arizona	29	-	3,736	314	-	3,128
Arkansas	23	1	3,317	162	-	3,501
California	89	8	31,354	2,020	5	35,419
Colorado	52	-	5,754	247	-	3,390
Florida	8	3	877	10	-	106
Georgia	20	-	1,851	34	-	656
Idaho	157	17	22,495	1,009	-	15,973
Illinois	4	-	730	4	-	48
Indiana	-	-	117	-	-	-
Kentucky	15	-	1,128	13	-	99
Louisiana	4	1	1,080	56	-	1,265
Maine	-	-	24	-	-	-
Michigan	5	-	1,053	72	1	258
Minnesota	5	1	1,180	56	-	555
Mississippi	1	5	950	201	6	2,094
Missouri	2	0	329	30	-	164
Montana	43	13	14,354	829	5	12,055
Nebraska						
Nevada	10	-	333	-	-	-
New Hampshire	1	-	376	16	4	543
New Mexico	51	-	3,288	283	-	2,632
New York	-	-	-	-	-	-
North Carolina	12	6	1,852	56	-	713
North Dakota	-	-	5			
Ohio	1	0	61		-	8
Oklahoma	-	-	205	20	-	371
Oregon	82	9	33,770	2,360	-	54,346
Pennsylvania	-	-	469	29	-	502
Puerto Rico	-	-	18	-	-	-
South Carolina	17	6	1,728	120	1	2,276
South Dakota	-	-	1,682	106	-	804
Tennessee	16	1	1,314	17	-	213
Texas	16	4	1,599	21	-	413
Utah	28	-	4,311	78	-	364
Vermont	3	1	335	5	-	86
Virginia	30	-	1,916	19	-	130
Washington	9	8	13,454	581	-	13,966
West Virginia	12	-	1,258	5	-	71
Wisconsin	-	-	1,471	33	-	311
Wyoming	36	2	3,598	253	1	2,190
Washington Office	-	-	5,759			
Total	793	108	180,281 1/	9,118	101	162,459

1/ Does not include 641 miles turned back to the Forest Service for construction. Includes $14,675 carryover from FY 1977.

TIMBER PURCHASER ROADS CONSTRUCTED
BY THE FOREST SERVICE IN FY 1978

State or Commonwealth	Miles	M$ Dollars
Alabama		
Alaska		
Arizona		
Arkansas	1	21
California	171	4092
Colorado	5	107
Florida	9	189
Georgia		
Idaho	30	923
Illinois		
Indiana		
Kentucky		
Louisiana	7	292
Maine		
Michigan	2	15
Minnesota	11	133
Mississippi	10	153
Missouri		
Montana	55	650
Nebraska		
Nevada		
New Hampshire		
New Mexico	35	147
New York		
North Carolina		
North Dakota		
Ohio		
Oklahoma		
Oregon	159	3075
Pennsylvania		
Puerto Rico		
South Carolina	2	30
South Dakota	17	207
Tennessee	10	114
Texas	3	32
Utah	1	21
Vermont		
Virginia	4	26
Washington	92	587
West Virginia		
Wisconsin	4	28
Wyoming	13	118
Washington Office		
Total	641	$10,960

10. Receipts and Expenditures

a. Receipts

Receipts from Forest Service Operations in FY 1978 totaled $1.1 billion (see Table C-22). This included $905 million in cash collected; $124 million in Roads Constructed by Timber Purchasers in lieu of cash payment; $474 thousand collected by the Department of Energy for Power Line Licenses and $87 million collected by BLM for mineral leases on NF lands.

Receipts from the sale or use of National Forest System Resources amounted to $765 million in FY 1978, an increase of 11% over FY 1977. Significant increases occurred in Timber (11%), land uses (16%) and recreation use (20%).

While the timber cut was down 10% the increased receipts can be attributed increased selling price. The price for timber has increased from $68.81 MBF in FY 1976 to $210.81/MBF in FY 1978.

The increase in land uses reflects increased demand for special uses of NF land.

The increase in Recreation receipts reflects the increased demand plus opening up of recreation facilities that were closed during the severe drought conditions in 1977.

During the fiscal year $134 million was collected for future expenditures on NF lands. 99 percent of these collections are a result of timber sale activities.

b. Expenditures

Expenditures for the National Forests and National Grasslands totaled $1.3 billion (see Table C-22). This amount included $392 million invested in capital improvements and property; $187 million was spent on maintaining real property investments in the National Forests System; $718 million was spent on administration and operations; and $10 million was spent performing work for others.

Due to the moderate Fire Season in 1978, the expenditures for Fighting Forest Fires was $11 million. This was $62.6 million below the 3 year average of $173 million.

Expenditures for research in FY 1978 totaled $108.8 million with $4.2 million spent for capital investment, $665 thousand spent for maintenance of real property, $101 million on research programs and $4.5 million spent on cooperative research and work for others.

Expenditures in support of State and Private activities totaled $74.7 million during FY 1978. Included in this total is $222 thousand for capital investment, $74 million for administration and payments to States and $1 million for work for others.

During FY 1978, the Forest spent $153 million in support of Human Resource Programs. Included in this total is $13 million in capital investment and $140 million in administration and operation of the program.

Under authority of 16 USC 500, as amended, the Forest Service pays to the States 25 percent of National Forests receipts to be used for the benefit of public schools and roads in counties containing National Forest Lands. This payment, based on FY 1978 receipts, was $238.8 million. Arizona and New Mexico also received $219 thousand under authority of 36 Stat. 562,573 and Minnesota received $259 thousand under authority of 16 USC 577g.

Counties containing National Grasslands and Land Utilization Projects received $1.2 million for schools and roads (based on calendar year 1977 receipts).

TABLE C-21

FISCAL YEAR 1978
Statement of Net Receipts from
National Forests, National Grasslands and Land Utilization Projects

OCTOBER 1, 1977 to SEPTEMBER 30, 1978
(In Thousands)

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 8	Region 9	Region 10	TOTAL	Total Same Period Last Year	Increase or Decrease
NATIONAL FOREST RECEIPTS												
Timber Purchaser Road Credits	18,771	1,617	2,098	656	19,745	62,153	7,397	1,224	10,520	124,181	144,170	-19,989
KV Collections	10,777	2,023	6,571	5,142	16,278	37,611	14,189	2,809	594	95,994	92,108	3,886
Timber and Forest Product Sales	31,618	2,639	16,997	15,298	153,444	431,005	42,556	4,595	1,208	699,360	625,927	73,433
Settlement & Trespass	38	279	-0-	-0-	-0-	-0-	49	16	-0-	382	386	-4
Grazing & Grazing Trespass	77	175	184	104	510	245	319	117	22	1,753	1,520	233
Land Uses	358	1,803	444	675	3,108	849	166	427	71	7,901	6,162	1,739
Recreation	12	27	47	16	121	19	112	29	3	386	364	22
Power	33	35	126	222	74	73	3,457	6,915	7	10,942	11,277	-335
Mineral Leases & Permits	147	501	405	626	1,752	659	1,035	934	16	6,075	5,506	569
Admission and User Fees	875	1,542	2,907	2,337	570	775	-0-	-0-	-0-	9,006	9,309	-303
Grazing in 11 Western States	62,706	10,641	29,779	25,076	195,602	533,389	69,280	17,066	12,441	955,980		
Total 25% Payment Base	74,993	11,507	27,958	25,848	189,184	476,251	62,260	18,507	10,221		896,729	
Total Same Period Last Year	-12,287	-866	1,821	-772	6,418	57,138	7,020	-1,441	2,220			59,251
Increase or Decrease												
NATIONAL GRASSLANDS & LAND UTILIZATION												
Timber and Forest Products Sales, Settlement and Trespass	-0-	-0-	1	-0-	-0-	-0-	-0-	-0-	-0-	1	3	-2
Grazing and Grazing Trespass	512	893	185	10	2	9	26	9	-0-	1,646	1,742	-96
Land Uses	16	54	6	-0-	1	2	2	1	-0-	82	50	32
Recreation	-0-	-0-	1	-0-	-0-	-0-	-0-	-0-	-0-	1	7	-6
Power	-0-	1	-0-	-0-	1	-0-	-0-	-0-	-0-	2	2	-0-
Mineral Leases & Permits	2,301	840	203	-0-	-0-	16	305	149	-0-	3,814	3,149	665
Admission & User Fees	1	-0-	-0-	-0-	-0-	3	-0-	-0-	-0-	4	5	-1
Total Nat'l Grassland & Land Utilization	2,830	1,788	396	10	4	30	333	159	-0-	5,550		
Total Same Period Last Year	2,324	1,645	467	17	4	6	300	195	-0-		4,958	
Increase or Decrease	506	143	-71	-7	-0-	24	33	- 36	-0-			592

Footnote:

06C Lands (National Forests)

Region 5	$ 185
Region 6	24,000
Total	$ 24,185

TABLE C-22

USDA - Forest Service
Statement of Receipts & Expenditures
FY 1978
($ in Thousands)

Receipts	National Forests	Oregon and Calif. Grant Lands	National Grasslands & L.U. Areas	Other	Total
Receipts from Sale and Use of Forest Resources					
Timber & Forest Products	699,360	24,153	1		723,514
Grazing	9,388	3	1,646		11,037
Land Uses	1,753	29	82		1,864
Recreation	13,976		5		13,981
Power	386		2		388
Mineral Leases & Permits	10,942		3,814		14,756
Total	735,805	24,185	5,550		765,540
Receipts from Deposits for Expenditures on NF's					
Timber Sale Area Betterment	65,592				65,592
Timber Salvage Sales	8,397				8,397
Brush Disposal	39,652				39,652
Restoration of Improvements	29				29
Cooperative Work	21,095				21,095
Total	134,765				134,765
Other Receipts					
Miscellaneous (Sale, Rental, etc.)				3,801	3,801
Golden Eagle Passports				5	5
Sale of Personal Property				51	51
Cooperative Research				1,144	1,144
Royalties from Sale of Smokey Bear & Woodsy Owl Products				215	215
Total				5,216	5,216
Other Income					
Estimated Collections by Dept. of Energy for Power licenses on Public Domain National Forest Land	474				474
Estimated Collections by Dept. of Interior for Mineral leases, licenses, and Permits on Public Domain National Forest Land	87,210				87,210
Estimated Value of Roads Built by Timber Purchasers in lieu of Cash Pay.	124,181				124,181
Total	211,865				211,865
Grand Total	1,082,435	24,185	5,550	5,216	1,117,386

TABLE C-22 (Cont.)
USDA-Forest Service
STATEMENT OF RECEIPTS AND EXPENDITURES
FY 1978
($ in Thousands)

Expenditures	Total	Assets	Operations	Work For Others
National Forest System				
Protection & Maintenance	441,698	14,822	426,876	(4,834)
Fighting Forest Fires	110,734	583	110,151	(3,724)
Insect & Disease Control	10,553	265	10,288	
Cooperative Law Enforcement	5,854	47	5,807	
Flood Prevention & Watershed Protection	4,350	401	3,949	
Restoration of Forest Lands	30	2	28	
Reforestation & Timber Stand Improvement	70,184	4,555	65,629	(11)
Timber Sale Betterment (K-V)	64,189	877	63,312	
Brush Disposal	32,539	661	31,878	
Timber Salvage Sales	4,938	624	4,314	
Oregon-California Grant Lands	3,193	3,474	(281)	
Land Planning Alpine Lakes	363		363	(36)
Construction & Operation of Recreation·Facilities	3,783	239	3,544	
Range Improvements	4,427	1,951	2,476	
Construction of Facilities	30,934	22,111	8,823	(769)
Acquisition of Lands, Forest Service	3,665	3,315	350	
Acquisition of Lands, L&W Conservation Fund	45,322	37,547	7,775	
Forest Roads & Trails	260,289	129,757	130,532	(678)
Purchaser Elections Road Construction	10,912	10,763	149	
Timber Purchaser Road Construction	162,459	159,428	3,031	
Restoration of Roads - Federal Highway Trust	6,998	554	6,444	
Cooperative Work for Others	21,077	739	20,338	
Total NFS	1,298,491	392,715	905,776	(10,052)
Research				
Research	106,295	2,662	103,633	(3,584)
Research Construction	1,625	1,564	61	(10)
Cooperative Research	941	13	928	
Total Research	108,861	4,239	104,622	(3,594)
State & Private Forestry				
S&PF Operations	52,402	118	52,284	(790)
Insect & Disease Management	7,883	16	7,867	(240)
Title IV Assistance to States Tree Plan	1,442	17	1,425	
RC&D	777	3	774	
RCFP Grants	3,434		3,434	
River Basins	1,724	1	1,723	(32)
Flood Prevention and Watershed Planning	4,128	29	4,099	(29)
Licensee Programs, Smokey Bear, & Woodsy Owl	188		188	
FIP, ACP & Miscellaneous	2,742	38	2,694	
Total S&PF	74,720	222	74,488	(1,091)
Human Resource Programs				
Youth Conservation Corps	24,452	544	23,908	
JoB Corps	39,936	2,667	37,269	
YACC	78,503	10,063	68,440	
Senior Citizens & Miscellaneous	10,626	11	10,615	
Total HRP	153,517	13,285	140,232	
GRAND TOTAL - Forest Service	1,635,589	410,461	1,225,118	(14,737)

D. HUMAN RESOURCE PROGRAMS

The Forest Service has a growing role in administering and hosting a variety of human resource programs. These programs provide work, skills, training, and education for the unemployed, underemployed, elderly, young, and the other disadvantaged persons. They also resulted in significant natural resource benefits. Approximately 49,000 people participated in Forest Service human resource programs in FY 1978. Total accomplishment for FY 1978 was equivalent to 12,800 person-years. This program reduced the backlog of needed conservation work. The current backlog is estimated to cost $2 billion of which $500 million is critically needed by 1985.

1. Senior Community Service Employment Program

The Forest Service participates in the Senior Community Service Employment Program, administered under Title V of the Older Americans Act. It is a cooperative program with the Department of Labor for economically disadvantaged people more than 55 years old, primarily in rural areas. The main benefits derived from the program by enrollees are supplemental income, work experience, and training. Enrollees also receive personal and job-related counseling, supervision, yearly physical examinations, and in some cases, placement in regular unsubsidized jobs. In return, valuable conservation projects are completed.

Projects provide work experience in, but not limited to: construction, rehabilitation, and maintenance of recreation areas; improvement and maintenance of trails; improvement of timber stands; wildlife habitat improvement; other resource improvement work and clerical support.

The present interagency agreement with the Department of Labor (July 1, 1978 to June 20, 1979) involves 3,095 authorized enrollee positions with a $13.3 million funding level. About 16 percent are minorities and 26 percent are women; 21 percent are under 70 years old. The Forest Service plans to contribute about $2.6 million to the operation of the program. Each dollar expended in this program results in an estimated $1.25 of work.

2. Young Adult Conservation Corps

The Young Adult Conservation Corps (YACC), provides year-round jobs for unemployed and out-of-school young men and women, ages 16 to 23, in conservation work on National Forests, National Parks, fish hatcheries, wildlife refuges, and other public lands. The program is administered jointly by the Department of Agriculture and the Department of the Interior through an inter-agency agreement with the Department of Labor. Thirty percent of the funds available are used to support a grant program for States to conduct YACC projects on State and local public lands.

FY 1978 was the first full year of operation for the Federal component of the program. The Forest Service, building on its long experience in youth and employment programs, moved rapidly to implement the program. Legislation was approved August 5, 1977. Four thousand, one hundred and eighty-two enrollees were working on Forest Service conservation projects by December 31, 1977, and 8,696 by September 30, 1978. Thirty-eight percent were women and 25 percent were minority.

The Forest Service program on Federal lands was funded at $81,550,000. The Forest Service State grant component was funded at $34,950,000. for 3,331 enrollees. Each dollar expended in this program results in an estimated $1.00 of conservation work.

3. Youth Conservation Corps

The goal of the Youth Conservation Corps (YCC) program is to provide gainful summer employment for 15 to 18-year-old youth from all segments of society, provide them with an educational understanding of their Nation's environment, and accomplish needed conservation work on public lands.

The YCC enrollees typically work hard in the out-of-doors on public lands on labor-intensive projects. A special environmental awareness learning program is integrated with the work program.

In 1978 over 44,000 young people were enrolled in camps in all States and Territories. Approximately thirty five percent of the camps are administered by the Department of the Interior; one-third by USDA-Forest Service, and 30 percent through a grant process to States and Territories.

The Forest Service program on Federal lands was funded at $21 million, with over 14,000 enrollees participating. Of the total enrollees, 20 percent were minorities and 48 percent were women. The Forest Service State grant component was funded at $9 million for approximately

Teenagers working in YCC during the summer return approximately $0.85 in appraised value of work accomplished for each dollar appropriated for the program.

4. Job Corps Program

The Job Corps Program, administered under the provisions of Title IV of the Comprehensive Employment and Training Act of 1973 (CETA), enrolled approximately 7,000 youths ranging from 16 to 21 years of age at Forest Service Centers during fiscal year 1978. In cooperation with the Department of Labor, 17 Job Corps Civilian Conservation Centers on National Forests provided educational and vocational training to

these youth. Ninety-four percent of enrollees completing the program were placed either in school, in the armed forces, or on a job.

One new Center was authorized during FY 1978. Present capacity is 50 enrollees. Upon completion of construction the capacity will increase to 224.

5. Other Human Resource Programs

During FY 1978, 7,000 people volunteered 400 person-years of work to perform a variety of conservation work on the National Forest. This work was valued at more than $3 million.

Forest Service involvement in various other programs such as College Work Study, Vocational Work Study, and CETA Hosting etc., resulted in hosting 8,600 people. Their work was valued at more than $13 million in FY 1978.

TABLE D-1

*SENIOR COMMUNITY SERVICE EMPLOYMENT PROGRAM

Region Station Area	Appraised Value of Work Accomplished	Number of Participants	Person-Years of Work
R-1	307,630	112	53.23
R-2	489,073	169	67.94
R-3	912,491	222	112.56
R-4	997,546	284	167.60
R-5	1,778,251	480	254.45
R-6	832,889	273	111.54
R-8	4,961,889	1,228	777.79
R-9	1,974,911	650	337.07
R-10	-0-	-0-	-0-
INT	-0-	-0-	-0-
NC	-0-	-0-	-0-
NE	-0-	-0-	-0-
PNW	24,135	7	2.50
PSW	-0-	-0-	-0-
RM	-0-	-0-	-0-
SE	-0-	-0-	-0-
SO	2,100	5	.3
FPL	-0-	-0-	-0-
NA	-0-	-0-	-0-
SA	-0-	-0-	-0-
WO	-0-	-0-	-0-
TOTAL	12,280,915	3,430	1,884.98

*Reports received as of January 10, 1979.

TABLE D-2

Human Resource Programs
YACC
Manpower Training Programs - Fiscal Year 1978

	Appraised Value of Work Accomplished	Man-Years of Work	Enrollee On-Board Strength September 30, 1978
Northeastern Area	305,832	23.41	38
Southeastern Area	705,892	57.13	103
Regions:			
1. Northern	1,518,161	180.13	318
2. Rocky Mountain	3,412,775	267.10	577
3. Southwestern	4,918,552	421.40	668
4. Intermountain	4,086,718	205.68	371
5. California	9,253,183	839.15	1,378
6. Pacific Northwest	9,055,320	740.12	1,135
8. Southern	11,651,580	1,005.31	1,569
9. Eastern	8,496,016	1,015.80	1,618
10. Alaska	4,944,345	240.78	443
Research Units:			
Intermountain Forest and Range Experiment Station	267,455	29.96	45
North Central Forest Experiment Station	454,843	46.37	70
Northeastern Forest Experiment Station	161,982	32.77	50
Pacific Northwest Forest and Range Experiment Station	420,657	27.78	37
Pacific Southwest Forest and Range Experiment Station	420,746	30.15	39
Rocky Mountain Forest and Range Experiment Station	169,798	17.42	31
Southeastern Forest Experiment Station	520,616	62.43	92
Southern Forest Experiment Station	430,290	36.05	48
Institute of Tropical Forestry	N/A	N/A	
Forest Products Laboratory	N/A	N/A	
W.O.	10,176	1.22	14
FOREST SERVICE TOTALS	61,204,927	5,280.16	8,644
SCS	N/A	N/A	52
GRAND TOTALS	61,204,927	5,280.16	8,696

TABLE D-3

Youth Conservation Corps - Fiscal Year 1978

	Number of Participants 1/	Man-Weeks of Participation	Minority Participation (Percent)
Northeastern Area	21	160	0
Southeastern Area	---	---	---
Regions:			
1. Northeran	927	7,054	81
2. Rocky Mountain	743	5,530	151
3. Southwestern	1,105	8,145	117
4. Intermountain	1,058	7,806	97
5. California	1,665	11,030	106
6. Pacific Northwest	936	7,386	212
8. Southern	3,606	25,857	127
9. Eastern	3,773	23,214	99
10. Alaska	284	1,502	141
Research Units:			
Intermountain Forest and Range Experiment Station	34	234	200
North Central Forest Experiment Station	---	---	---
Northeastern Forest Experiment Station	---	---	---
Pacific Northwest Forest and Range Experiment Station	---	---	---
Pacific Southwest Forest and Range Experiment Station	---	---	---
Rocky Mountain Forest and Range Experiment Station	---	---	---
Southeastern Forest Experiment Station	---	---	---
Southern Forest Experiment Station	30	231	91
Institute of Tropical Forestry	---	---	---
Forest Products Laboratory	---	---	---
TOTAL	14,192	98,237	193 (average)

* Forest Service only. Does not include Department of the Interior or State grants. Value of work accomplished not yet available.
1/ Estimated figures based upon semi-final printout 10/07/78.

TABLE D-4

Job Corps Program - Fiscal Year 1978

	Appraised Value of Work Accomplished	Number of Participants	Man-Years of Work
Northeastern Area	N/A		
Southeastern Area	N/A		
Regions:			
1. Northern	$1,654,700	896	448
2. Rocky Mountain	1,543,650	784	392
3. Southwestern	N/A		
4. Intermountain	N/A		
5. California	N/A		
6. Pacific Northwest	2,302,225	1,742	871
8. Southern	4,992,995	2,674	1,337
9. Eastern	1,080,085	870	435
10. Alaska	N/A		
Research Units	N/A		
Total	$11,573,655	6,966	3,483

TABLE D-5

*VOLUNTEERS

Region Station Area	Appraised Value of Work Accomplished	Number of Participants	Person-Year of Work
R-1	129,738	253	16.04
R-2	278,793	911	38.72
R-3	378,405	396	49.28
R-4	339,108	1,342	43.04
R-5	645,474	1,850	115.77
R-6	562,122	1,429	62.77
R-8	275,584	373	31.32
R-9	104,281	167	16.00
R-10	48,893	34	6.00
INT	24,858	7	5.50
NC	65,534.20	26	6.16
NE	2,000	1	2.50
PNW	45,796	66	3.00
PSW	40,000	29	4.00
RM	5,910	10	1.00
SE	32,675.23	23	2.44
SO	-0-	-0-	-0-
FPL	-0-	-0-	-0-
NA	-0-	-0-	-0-
SA	20,000	1	.25
WO	9,000	12	3.10
TOTAL	3,008,171.43	6,930	406.89

*Reports received as of January 10, 1979.

TABLE D-6

*OTHER HUMAN RESOURCE PROGRAMS

Region Station Area	Appraised Value of Work Accomplished	Number of Participants	Person-Year of Work
R-1	1,597,305	743	208.41
R-2	821,300	569	103.15
R-3	483,702	188	58.32
R-4	703,418	610	128.84
R-5	4,121,537	3,689	500.50
R-6	3,177,654	1,692	289.61
R-8	1,259,473	522	181.59
R-9	582,450	271	83.06
R-10	-0-	-0-	-0-
INT	87,360	41	21.00
NC	12,447	11	1.63
NE	21,078	26	2.80
PNW	101,400	64	11.00
PSW	-0-	-0-	-0-
RM	40,850	68	5.84
SE	31,240.16	13	4.48
SO	39,900	52	27.2
FPL	-0-	-0-	-0-
NA	-0-	-0-	-0-
SA	9,200	11	1.70
WO	-0-	-0-	-0-
TOTAL	13,090,314.16	8,570	1,629.13

*Reports received as of January 10, 1979.

E. BENEFIT VALUES

Enclosed are tables of Forest Service benefit values by Forest Service Region. Values are identified using the codes obtained from the Forest Service Management Information Handbook (9/7/77). These values were developed so that the relationship between input costs (work process) and outputs and benefits can be analyzed on a common basis throughout the Forest Service. Therefore, these values are used in any economic analysis to make direct comparisons with Forest Service costs and have been applied only to the amount of output that can be reasonably expected to be utilized.

An effort has been made to use a consistent valuation concept to evaluate all resource outputs. To achieve this, values for all resources were conceptually based on the average willingness to pay.

Regional estimates of the resource values were developed in conjunction with a number of university cooperators, and for all resource values except for some values in recreation and wildlife and fish components, these values essentially equal market values. In the case of water and range values, adjustment coefficients have been applied. These values have been adjusted to reflect the Forest Service's relative share in producing the outpout and to reflect the proper relationship to the Forest Service's costs. These coefficients have been agreed upon through earlier negotiations with the Department of Agriculture and OMB.

Table E-1
FY 1981 Willingness to Pay (WTP) Values
DOLLAR VALUE FOR UNIT OF OUTPUT BY FIELD LOCATION

	Units	R-1	R-2	R-3	R-4	R-5	R-6	R-8	R-9	R-10
Dev. Rec. Use - Pub.	RVD	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Dev. Rec. Use - Pvt.	RVD	3.00	3.00	3.00	3.00	3.50	3.50	2.50	2.00	3.00
Disper. Rec. Use	RVD	3.00	3.00	3.00	3.00	5.50	3.00	5.50	5.50	3.00
Visitor Info. Ser. Use	RVD	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Wilderness Use	RVD	8.00	8.00	8.00	8.00	10.00	10.00	15.00	14.00	10.00
Big Game Use	RVD	10.50	10.50	10.50	10.50	10.50	10.50	10.50	10.50	10.50
Other Game Use	RVD	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Non Game Use	RVD	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25
Cold Water Fish Hab. Imp.	RVD	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
Inland Sport Fish CW/WW Use	RVD	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25
Sport Fish Ocean Use	RVD	--	--	--	19.50	19.50	19.50	--	19.50	19.50
Commer. Anad.	MLBS	800.00	--	--	--	800.00	800.00	--	420.00	800.00
Warm Wtr. Intmed. Hab. Imp.	RVD	4.25								
Anad. Sport Hab. Imp.	RVD	19.50	--	--	19.50	19.50	19.50	--	19.50	19.50
Anad. Commer. Hab. Imp.	MLBS	800.00	--	--	--	800.00	800.00	--	420.00	800.00
Waterfowl Use	RVD	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Wildlife Hab. Imp.	RVD	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Grazing Use - 1/ Livestock	AUM's	4.40	3.80	3.90	5.00	3.30	3.00	2.45	3.35	3.00

Table E-1 (continued)
DOLLAR VALUE FOR UNIT OF OUTPUT BY FIELD LOCATION

Output Description	Unit	R-1	R-2	R-3	R-4	R-5	R-6	R-8	R-9	R-10
Grazing Use - Wild Horses & Burros 1/	AUM's	4.40	3.80	3.90	5.00	3.30	3.00	2.45	3.35	3.00
Timber Prod. Sold - HW ST 2/	MBF	--	1.60	3.15	5.85	4.00	24.30	33.50	44.35	6.75
Timber Harvest - HW ST 2/	MCF	--	8.95	17.65	32.75	21.20	128.80	187.60	248.35	37.80
Timber Prod Sold - SW ST 2/	MBF	57.35	22.00	84.00	22.10	130.85	166.15	107.00	37.05	11.80
Timber harvest - SW ST 2/	MCF	321.15	123.20	470.40	123.75	693.50	880.60	599.20	207.50	66.10
Timber Prod Sold - HW RW 2/	MCF	--	6.05	--	25.30	57.25	--	16.80	18.95	6.05
Timber Prod. Pot - HW RW 2/	MCF	--	4.85	--	20.25	45.80	--	13.45	15.20	4.85
Timber Prod. Sold - SW RW 2/	MCF	10.10	12.10	30.85	77.60	16.85	40.00	80.55	70.30	28.90
Timber Prod. Pot - HW ST 2/	MCF	--	7.15	14.10	26.20	16.95	103.00	150.10	198.70	30.25
Timber Prod. Pot - SW ST 2/	MCF	256.90	98.55	376.30	99.00	554.80	704.50	479.35	166.00	52.90
Timber Prod. Pot - SW RW 2/	MCF	8.10	9.70	24.70	62.10	13.50	32.00	64.45	56.25	23.10
Ave. Annual Water Yield	MAF	15,500.0	10,000.0	10,000	10,000	5,200.0	3,000.0	3,000.0	2,000.0	2,000.0
Improved Water Yield	MAF	750.0	500.00	500.00	500.00	2,600.0	1,500.0	1,500.0	1,000.0	500.00
Improved Water-Quality	MAF	1,560.0	1,560.0	1,560	1,560	4,680.0	1,560.0	4,680.0	4,680.0	1,560.0
Water Quality Min. Stds. or Higher	MAF	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00
Net Sediment Reduction (Average)	MAF	4,000.0	4,000.0	2,000.0	2,000.0	4,000	2,000.0	4,000.0	4,000.0	2,000.0
Flood Damage Reduction	M$	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0

Table E-1 (continued)

DOLLAR VALUE FOR UNIT OF OUTPUT BY FIELD LOCATION

Output Description	Unit	R-1	R-2	R-3	R-4	R-5	R-6	R-8	R-9	R-10
Improved Soil Productivity 3/	MBF	40.15	15.40	58.80	15.50	104.40	116.30	74.90	25.95	8.25
Improved Soil Productivity 3/	AUM	3.10	2.70	2.75	3.50	2.30	2.10	1.70	2.35	2.10
Common Variety Sand & Gravel	Tons	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Leasable Phospate 4/ Rock Barite - 8 Lead - 9	Tons	4.45	4.45	4.45	4.45	4.45	4.45	82.50	82.50	--
Energy Related 4/ Coal, Petroleum Natural Gas, Geothermal	BBTU	284.00	89.00	241.00	50.00	253.00	36.00	212,00	155.00	313.00

1/ Values have been adjusted to reflect the Forest Service's relative share in producing the output.
2/ HW = hardwood, SW = softwood, ST = sawtimber, RW = other procucts excluding sawtimber.
3/ A weighted average potential productivity based mainly on anticipated future for timber and range.
4/ Value is a weighted mix of outputs. For information on weights contact RPA in WO.

*U.S. GOVERNMENT PRINTING OFFICE : 1979 0-280-931/FS-49